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THE IRON TRADE REVIEW

VOLUME XXXII. CLEVELAND, O. JANUARY 5, 1899. CHICAGO, ILL. NUMBER 1

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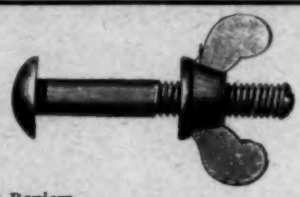

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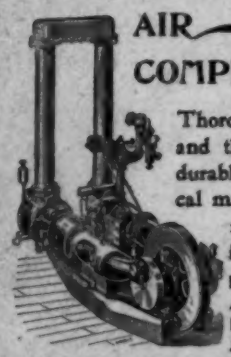

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THE IRON TRADE REVIEW

VOLUME XXXII. CLEVELAND, O. JANUARY 5, 1899. CHICAGO, ILL. NUMBER 1

THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The iron trade has crossed the line into the new year with the tide of mid-winter prosperity still running high, and destined from all appearances to rise higher. Such activity at the close of a year brings to mind that of 1879–80, but it is to be hoped the parallel will end there. The best students of the situation believe that it will and that no boom will come; at the same time conditions are recognized that will scarcely fail to give measurably higher prices. In several lines advances have came in the past week and others are in sight. In foundry iron, for example, there is no prospect of any important addition in the near future to the number of active furnaces, either in the South or in the North. In both sections the question of ore supply is a barrier, apart from the prohibitively low prices still ruling. After May 1, some Northern furnaces that have alternated between Bessemer and foundry iron might do more in the latter if conditions warranted. But price would be the determining factor. In Bessemer pig iron the outlook is very favorable for the furnaces; the chief limitation apparent, pending the additions to furnace capacity now under way, is the possible inadequacy of existing steel plants to meet the consumption of Bessemer steel. Not a few steel works are sold up to the middle of the year, and the leading rail mills are already so well filled with 1899 orders that they will not be heard from as contributors to billet tonnage. It is probable that the rail engagements for 1899 are already quite above 1,250,000 tons, apart from export orders, on which in 1898 shipments were close to 300,000 tons. Prices were advanced the past week to $19 Pittsburg, which is $1 a ton above the basis on which much of the business in standard sections has been booked. The incursions by an Eastern mill into Central territory, resulting in a $17 price on some contracts, appear to be at an end, and all producers are now asking more money because of crowded order books and the advance in steel and in most finished materials. The Pennsylvania Co.'s order, placed the past week, gives the Pennsylvania Steel Co. 30,000 tons, Lackawanna 5,000 tons, Cambria 30,000 tons, Carnegie Steel Co., 30,000 tons, and the Federal Steel Co., 10,000 tons. The beam manufacturers opened the new year with the expected announcement of an advance—$2 on beams and channels and $1 on angles. Plate mills are very firm and some of them will be out of the market or weeks to come, with six months business ahead of them. Pipes and tubes are 2½ per cent higher because of higher steel and the excellent demand. Steel billets are advancing and the engagements of the mills are beyond precedent at the opening of the year. The Pittsburg market is fairly $16.65, with little steel to be had. Sheet bar contracts run on to the middle of the year, so that the arrangements of the American Tin Plate Co. for its supply of bars is not of imminent consequence to the market. The plans of the American Steel & Wire Co. have developed further within the week. It is now quite certain a Pittsburg rod and wire mill, with connected steel plant and blast furnace, and a Western Pennsylvania wire and rod mill have been secured, in addition to the plants mentioned last week. The consequence of these moves is likely to be far-reaching and for the moment puts the trade quite at sea, coming so closely upon the tin plate consolidation. In the pig iron market there has been further selling to the foundry trade the past week, though not on the scale of the few weeks preceding. Cincinnati, as the Southern iron selling center, reports that the majority of inquiries are coming to naught because of a lack of iron; that four-fifths of the furnaces in the South are out of the market, but that meantime there is continued buying of car wheel, malleable and other special irons. In Bessemer iron there has been no movement, but $10.50 is now the figure of the associated furnaces.

PITTSBURG.

OFFICE OF *The Iron Trade Review and Industrial World.*
705 PUBLICATION BUILDING, Jan. 4.

The new year opens more auspiciously for the iron and steel trade than any of its predecessors for a long time. Prices are firm in almost all lines and the mills are well filled with orders while the general average of prices is a decided advance over a month ago. There has been active inquiry already this week, but few transactions. The most important development since the last report is the further acquisition of properties by the American Steel & Wire Co. The Pittsburg Wire Co. was secured recently, and it is now learned on excellent authority that arrangements have been completed by which the consolidation secures the plant of the Oliver Wire Co. and the steel plant and Rosena Furnace of the Oliver & Snyder Steel Co. It is understood on the same authority that the rod mill and wire and nail works of the Shenango Valley Steel Co., at New Castle, have been secured, with presumably an arrangement in regard to a part of the product of the steel works, while the negotiations with the Washburn & Moen Mfg. Co. are progressing satisfactorily and the Cleveland Rolling Mill Co.'s properties have been secured under option. The consolidation will thus be in full control of the situation for a few months, until the several rod mills now under way are completed. Rods in consequence are very scarce. The American Steel & Wire stock has been fluctuating violently. The American Tin Plate Co. is still formulating its policy in regard to the sale of the product, etc., but the proceedings are very quiet.

PIG IRON.—In all grades the strength is well maintained without decided change, except that in Bessemer $10.25, valley, can no longer be done. The producers do not desire to sell and would not quote below $10.50. Foundry irons are quiet after the active buying of last month. The demand is now being supplied by the local furnaces, the Southern and Ohio furnaces being unable to get into the district. Southern No. 2 foundry, delivered Pittsburg, would be nearly a dollar a ton above the prices accepted by the local furnaces. We quote:

Bessemer, valley furnace	$10.35 to $10.50
Bessemer, Pittsburg	10.75 to 10.90
No. 1 Foundry	11.10 to 11.30
No. 2 Foundry	10.50 to 10.60
No. 3 Foundry	10.00 to 10.10
Gray Forge, valley furnace	9.30 to 9.50
Gray Forge, Pittsburg	9.75 to 9.80

BILLETS AND RODS.—Billets are very scarce, as is evidenced plainly by the fact that for prompt or January delivery nothing below $16.60, maker's mill, could be done, and as high as $16.75 might have to be paid, while for the first quarter $16.50 could be done, which is an advance over

last week's quotation. In sheet bars there is practically nothing doing. It is probable that the developments of the next few months in this line will be very interesting. Meanwhile we quote the market nominal at $17.25 for long lengths. Wire rods are very scarce and while quoted at $23 a round lot would be very difficult to secure on account of the general absorption of rod mills by the wire combine.

PLATES.—The plate market continues without decided change. Prices are firm. We still quote: Tank, 1.20c to 1.25c; shell, 1.30c; flange, 1.35c; fire-box, 2c and upward.

SHEETS.—It is very difficult to secure round lots of sheets for extended delivery, even at a fair advance in price, while small lots can be had at former quotations, 1 90c to 1.95c for No. 28 common. The mills evidently feel that something good is likely to develop in their line. The firmness cannot be due to the mills having booked extensively in the past few weeks, as this would undoubtedly have resulted in correspond ing purchases of sheet bars, which has not been the case. In galvanized sheets the condition is much the same Small lots may be had at 80 and 5 to 80 and 7½, and possibly 80 and 10 might be secured, but only for small lots and near-by deliveries in any case.

SPELTER.—This metal has further declined and may be had at 4.90c, or a shade lower in the local market, St. Louis being dull at 4.75c.

IRON AND STEEL SKELP.—The skelp market is firm at the advances already noted. We quote: Grooved iron skelp, 1.07½c to 1.10c; sheared iron skelp, 1.20 to 1.22½; grooved steel skelp, 97½c to 1.05c; sheared steel skelp, 1.15c to 1.17½c.

FERRO-MANGANESE AND SPIEGEL.—There is no change in these lines, domestic 80 per cent ferro-manganese being quoted at $50 and spiegeleisen at $23.50 to $24.

RAILS AND TRACK MATERIAL.—There is moderate buying of rails at from $18 to $19, Pittsburg, prices being advanced in view of heavy bookings. Track material continues in excellent demand, and prices are firm, with the advance recently made in links and pins. We quote: Spikes, 1.45c; track bolts, 1.65c to 1.70c; splice bars, 1.10c to 1.15c; links and pins are quoted from 1.30c to 1.35c.

PIPES AND TUBES.—The pipe market is quite firm. Last week an advance was made in some of the base discounts, and in the additional discounts. In galvanized, butt weld was advanced from 47½ to 45 off, and lap weld from 52½ to 50 off. These advances are spoken of as an advance of 5 per cent, but they are really 4.76 per cent on butt galvanized and 5.26 per cent on lap galvanized, as regards the base discounts. The additional discounts were advanced by changing the last 10 of the six tens to 7½ per cent, with the extra 5 for car loads as it was. This makes an actual advance in net prices of 2.78 per cent. The fact that the actual advances on net prices are different from the advances as they are customarily spoken of shows the disadvantageousness of quoting prices in this manner. The new discounts are now as follows: Additional discounts:—Five tens seven and a half for less than carloads with an extra five for carloads; base discounts:—Butt weld, black, 55 per cent off; lap weld, black, 65 per cent off; butt weld, galvanized, 45 per cent off; lap weld, galvanized, 50 per cent off. Discounts on merchant boiler tubes are as follows: 2¼-inch and smaller, 72½ per cent off; 2½ inch and larger, 75 per cent off, with an extra 5 per cent to dealers. Inserted joint casing is quoted at 60 off and screw and socket joint casing at 60 and 10 per cent off, with an extra 2½ per cent to dealers.

STRUCTURAL MATERIAL.—Beams and channels were advanced last week 10 cents a hundred, and tees, zees and angles five cents a hundred. There is heavy inquiry and a moderate booking of orders, and the advance was made on the principle that it would be better to raise prices at once rather than wait, as the manufacturers usually have done, until heavy orders were booked. Prices now stand: Beams and channels, 3 to 15 inches, 1.30c; 18 to 24 inches, 1.40c; tees, 1.30c; zees, 1.25c, and angles, 1.15c.

OLD MATERIAL.—This market is without material change, with a moderate degree of activity. Some slight changes are made in quotations, which are as follows: Old steel rails, long lengths, $10, cut, $10 50; old iron rails, $14; wrought iron scrap, $11.50, net valley; cast borings, $5.75; busheling scrap, $9, net; car wheels, $10.25, gross; cast scrap, $9, gross; iron axles, $6, net; steel axles, $12.50, gross; charcoal scrap, $10, gross; wrought turnings, $6.75, net, valley.

CHICAGO.

OFFICE OF *The Iron Trade Review and Industrial World*, 1522 MONADNOCK BLOCK, Jan. 4.

Christmas week was rather more quiet than were the two or three weeks preceding, but still nearly every branch of the market showed good sales. The end of the year brings with it the utmost confidence in the future on the part of all iron men, and the belief that 1899 will show an extraordinarily large tonnage of all forms of iron and steel, and prices in advance of those now prevailing. Statistics bear out this belief. With mills and furnaces nearly all sold up for from three to six months into 1899, and still a very large demand for material for early delivery, there could scarcely be a stronger situation. Whether the belief entertained by many of the trade, that there will be a shortage in some lines of material within the next six months, will come true, remains to be seen. The pr sent condition of the market, however, gives some warrant for this belief.

PIG IRON.—The demand last week was hardly as large as that of the two weeks previous. The total tonnage of sales, however, was much larger than has ever been known in Christmas week. This is particularly true of Northern iron, of which large sales were made. Southern iron was in good demand, and sales might have been larger had the furnaces been more willing to accept business. Most of them have either withdrawn from the market entirely, or require their agents to communicate with them before accepting any orders of over 50 tons. Producers are so well sold up for the next few months, as to be very independent; they are consequently enabled to dictate terms to buyers. Whether the demand will continue into next month is undecided. Many of the purchases made in December were made by concerns who are in the habit of buying in January, and who placed their orders earlier this year because of the unusual conditions prevailing and the likelihood of higher prices Consumers are using much more iron than ever before, however, and instances of concerns that have had to increase their purchases over their original intentions, because of their larger requirements, are numerous. The demand for castings seems to grow larger every day. With this condition of affairs, there is every reason to suppose that purchases of iron will be heavy throughout the coming year, and that prices can at least be no lower than at present, while they may be considerably higher. The local furnaces continue to talk higher prices, but no advances have been made as yet. Quotations are unchanged as follows:

Lake Sup. Charcoal	$11 50 @ $13 00	Southern Coke No. 3	$10 60 @ 10 85
Local Coke Fdy. No. 1	11 50 @ 12 00	Southern No. 1 Soft	11 10 @ 11 35
Local Coke Fdy. No. 2	11 00 @ 11 50	Southern No. 2 Soft	10 85 @ 11 10
Local Coke Fdy. No. 3	10 75 @ 11 00	Southern Silveries	11 75 @ 12 25
Local Scotch Fdy. No. 1	11 50 @ 12 00	Jackson Co. Silveries	12 50 @ 14 50
Local Scotch Fdy. No. 2	11 00 @ 11 50	Ohio Strong Softeners	12 00 @ 12 50
Local Scotch Fdy. No. 3	10 75 @ 11 00	Alabama Car Wheel	15 00 @ 16 00
Southern Coke No. 1	11 10 @ 11 35	Malleable Bessemer	11 00 @ 12 00
Southern Coke No. 2	10 85 @ 11 10	Coke Bessemer	11 00 @ 12 00

BARS.—Considerable sales of bar iron and steel were made last week, to consumers of all classes Numerous large sales were made, including one order of 3,000 tons or more. The demand continues large, and good sales are expected to be made this month. Prices are firmer, and are now made at 1.05c to 1.10c for common iron; 1.10c to 1.15c for guaranteed, and 1.05c to 1.10c for billet stock steel.

RAILS AND TRACK SUPPLIES.—Several good sized orders of standard rails were closed in this market last week, nearly all of them by mills in the agreement. Light rails sold well. Quotations are made as follows: Standard section rails, $19; light rails, $20 and upwards; steel splice bars, 1.15c to 1.25c; track bolts with square nuts, 1.80c to 1.90c; hexagon nuts, 1.90c to 2c; spikes, 1.55c to 1.60c.

BILLETS AND RODS.—Local mills took no business last week, being sold up. Some business was placed by Eastern mills, but it was not large. Billets are quoted at $17 50, and rods at $22.50 to $23.

CAR ORDERS.—Several small orders were placed, and more are in the market. The demand for car material of all kinds continues excellent, and good sales were made.

STRUCTURAL MATERIAL.—General business last week was heavy, much more than is usual at this season of the year, and bids fair to continue so for some time. No very large contracts were placed. Quotations are as follows: Beams, 15 inch and under, 1.35c to 1.40c; 18-inch and over, 1.45c to 1.50c; angles, 1.25c to 1.30c; sheared plates, 1.25c to 1.40c;

universal plates, 1.40c to 1.50c; tees, 1.40c to 1.45c; zees, 1.35c to 1.40c. Small lots from stock are quoted at ¼c to ½c higher.

PLATES.—Business last week was most excellent and included several large orders. The local mills closed orders of between 5,000 and 6,000 tons. Prices are very firm. Quotations are as follows: Tank plates, 1.30c to 1.40c; flange steel, 1.35c to 1.45c; fire-box steel, 1.85c to 5c.

SHEETS.—Orders for black sheets were of considerable size last week, and included two or three large contracts. Galvanized sheets hardly did as well, but were in fair demand, considering the season of the year. Quotations are made at 2c to 2.10c for black sheets, and 80 and 7½ per cent off for galvanized.

MERCHANT STEEL.—There is a heavy demand for all kinds of steel, and sales last week were correspondingly good. The mills are full of orders, and have refused orders that called for too early delivery. Quotations follow: Open-hearth spring, tire and machinery steel, 1.65c to 1 75c; smooth finished machinery steel, 1.60c to 1.70c; smooth finished tire, 1.50c to 1.60c; tool steel, 5.50c to 7.50c; specials, 11c and upwards.

SCRAP.—The demand for old iron rails is large, and good sales were made last week. Included among them were two orders of 1,000 and 1,500 tons each. All kinds of scrap are in better demand, and sales are growing larger. In some grades there is a considerable shortage. Dealers' selling prices are as follows:

Old iron rails, gross	$13 00@$13 50	Axles, net	$14 50@$15 00
Old steel rails, long, gr.	10 50@ 11 00	Cast borings, net	4 25@ 4 50
Old steel rails, short	8 75@ 9 00	Wrought turnings, net	6 00@ 6 50
Old wheels, gross	11 50@ 11 75	Axle turnings, net	7 00@ 7 25
Railroad forge, net	11 50@ 12 00	Mixed steel, gross	7 45@ 7 50
Dealer's forge, net	10 00@ 10 50	Stove plates, net	5 75@ 6 00
No. 1 mill, net	8 50@ 8 75	Heavy melting steel, gr.	8 25@ 8 50
Heavy cast, net	8 50@ 9 00	Old iron splice b., net	12 75@13 00
Malleable cast, net	8 00@ 8 50		

CLEVELAND.

OFFICE OF *The Iron Trade Review and Industrial World*, 27 VINCENT ST., Jan. 4.

The failture of the producers of non-Bessemer ores to agree on any basis of prices in 1899 was briefly announced last week. No rush to make sales has followed, and thus far two sales of high phosphorus Menominee range ores referred to a short time ago make up the transactions. There is no reason to change the statements heretofore made as to advances over 1898 prices, even with the fullest competition. For the present furnacemen show no disposition to make contracts. December made an unusul record of ore sales from the docks, the total being from 100,000 to 200,000 tons, chiefly of Bessemer grades. Among rumors of changes in the ore trade is the report of negotiations by a Pittsburg interest for a well known Mesabi mine. The purchase of the Norman, which is another transaction, is noted elsewhere. There is no immediate expectation of a meeting of Bessemer ore producers for 1899.

PIG IRON.—There is quietness in the Bessemer pig iron market. The present price is in the neighborhood of $10.50 valley furnace, but the actual coming into the market of a buyer is necessary to establish a quotation. The furnaces are so comfortably sold for the first four months that they are not pushing for trade. Business is expected to mature later in the month. Foundry iron sellers are firm but not uniform in prices. While $9.75 cash is the general minimum for No. 2 at furnace, a sale of several hundred tons is reported at $10 40 delivered, four months, equivalent to about $9.60 cash at furnace. These sales are rare. Softeners have been in good demand. Gray forge has sold at $9.50 valley furnace, and the supply is not plentiful. We quote f. o. b. Cleveland:

Bessemer	10 90	Valley Scotch No. 1	$10 65@10 90
No. 1 Strong Foundry	10 65@10 75	Valley Scotch No. 2	10 25@10 40
No. 2 Strong Foundry	10 25@10 40	Gray Forge	9 90
No. 3 Foundry	10 00	Lake Superior Charcoal	11 50

BILLETS AND RODS.—Billets recently coming to local rod mills were bought at prices from $1.50 to $2 below the market to-day. No large contracts for 1899 have been entered into in view of the early acquisition by the American Steel & Wire Co., of steel works of its own. In rods practically nothing is doing pending the absorption of mills by the big company, but the quotation is $22.50 to $23.

FINISHED MATERIAL.—Business in structural material amounting to about 2,000 tons, divided among several buyers, was a feature of the week. Consumers evidently appreciated the tendency of the market and got in before the advance of $2 in beams and channels and $1 in other shapes was announced. Another vessel is being figured on, bids being submitted by several yards. About 3,000 tons of plates and shapes will be required. The plate market is still stronger, one Pittsburg mill being filled up for six months and other mills doing business in this district being out of the market on anything like early delivery. The Pittsburg price for tank is 1.25c. Steel bars are especially well sold in the smaller sizes, and on specifications in which these are prominent 1c, Pittsburg, half extras, is firmly quoted. In sheets the usual range is 1.05c to 2.10c, Cleveland, for No. 28 black. The wire and wire nail mills are selling only for immediate delivery, and the policy of the controlling interest is evidently to work away from long-delivery sales to jobbers and to keep closely up with consumption. This will prevent the accumulation of stocks in middle hands and will make advances in price quickly operative. The current quotations are 1.35c for wire nails, single carload lots; 1.20c for smooth wire and $1.70 for barb wire. Stocks of the latter are being accumulated at mills for the heavy demand expected with the opening of spring.

OLD MATERIAL.—There is a fair demand in all lines with the stronger tone of the past few weeks maintained. We quote old iron rails at $14 to $14.25 valley mill; old steel rails, $9.50 to $9.75; old car wheels, $11, Cleveland; mill scrap, $8.50 at mill; wrought turnings, $7; cast borings, $5 50; machinery cast scrap, $8.25 to $8 50; No. 1 railroad wrought scrap, $12 delivered at mill; stove-plate, $6, delivered Cleveland.

CINCINNATI.

Jan. 3.

Rogers, Brown & Co.'s report says: The business of the week under review has been unique, in that many opportunities to make sales have been rendered absolutely impossible because of the inability of the furnaces to supply the iron. Consumers requiring certain grades have found themselves in some cases unable to secure material from any source whatever. The condition of the market is somewhat chaotic in consequence. As remarked last week, furnaces are pursuing an exceedingly conservative policy in not advancing prices to an extreme point. Some of them have withdrawn from the market on all grades; others have instructed their agents to make no sales except for such grades as they may feel can probably be provided to a limited extent. The general situation would indicate that higher prices may be looked for with the opening of the first week of the year. The railroads are stiffening up in the matter of freight rates and demanding uniformly the full rates of the tariffs, which is a healthy sign. There is a slight improvement in car supply, though transportation facilities are entirely inadequate for the current business. Money continues abundant. The volume of business going clearly indicates that consumption is maintained at the highest level ever reached in the country, and there are signs of general prosperity on every hand. The old year closes with all the markets in good form. We quote for cash f. o. b. cars Cincinnati: Southern Coke, No. 1 foundry, $10.50; No. 2, 10.25; No. 3, $9.75; No. 4 and gray forge, $9.25; mottled, $9.25; No. 1 soft, $10.50; No. 2, soft, $10.25; Hanging Rock charcoal, No. 1, $15.50 to $16; Jackson Co. silvery; No. 1, $12.50 to $12.75; standard Georgia carwheel, $14.25 to $15.

PHILADELPHIA.

Jan. 2.

A home trade, the largest ever known, and an export trade that has established itself as a permanent factor in the world's commerce, are the leading features of the iron and steel trades at the opening of the new year. Exports were certainly 50 per cent greater in 1898 than in 1897. To-day mills and furnaces in this district are working to full capacity, many having from three to six or seven months work on hand. And in this season, ordinarily the quietest of the year, there is very little let-up from the activity that was so marked throughout December. All indications in the pig iron market favor an advance in price, with a prospect, also, of some increase in production. We quote No. 1X foundry at $12 to $12.25; No. 2X at $11.25 to $11.50, the average Lehigh valley furnace now holding No. 2 at $11 at furnace. Billets are stronger, keeping pace with the movement in the Pittsburg district. As against $17 only a few weeks ago, we now quote $18.50, and sellers are quite firm in their ideas. This is about $2 25 advance from the low point in the middle of the year. In finished material plates are still the strongest line, going to 1.30c a week ago and to-day are quoted 1.35c, with mills disinclined to take business except as their regular trade must be provided for. Eastern bar manufacturers have thought the time ripe for an advance from the disappointing prices that have ruled for so many months. The prices which the recent meeting decided to aim at are 1.02½c for common iron, 1.10c for refined and 1.15c for test iron. It is the sense of the manufacturers that a united effort must be made to lift prices above the profitless level that has been the marked exception to the course of other lines. Mills are well booked in structural material and there is a steady demand in moderate lots, thoughno big work has matured, nor is it expected yet.

THE IRON TRADE REVIEW
AND
INDUSTRIAL WORLD.

DEVOTED TO MACHINERY, METAL-WORKING AND FOUNDRY TRADES AND IRON AND STEEL MANUFACTURE.

PUBLISHED EVERY THURSDAY BY
THE IRON TRADE REVIEW CO.,
CLEVELAND, OHIO.

CLEVELAND, 27 VINCENT STREET.
G. H GARDNER, President. A. I. FINDLEY, Editor.

CHICAGO:
1522 MONADNOCK BLOCK.
B. M. GARDNER, Associate Editor and Western Manager.

PITTSBURG:
705 PUBLICATION BUILDING.
B. E. V. LUTY, Manager.

Subscription (strictly in advance), $3 per annum. Advertising Rates Furnished on Application.

The Cleveland News Co. will supply the trade with THE IRON TRADE REVIEW through the regular channels of the American News Co.

ENTERED AT THE POST OFFICE AT CLEVELAND, O., AS SECOND CLASS MATTER

JANUARY 5, 1899.

MORE AMERICAN STEEL AND WIRE CO. DEALS.

In addition to the plants of the Cincinnati Barbed Wire Fence Co. and the Pittsburg Wire Co., as noted a week ago, the American Steel & Wire Co. has made important acquisitions in the past week, and promises soon to be well in control of the wire and wire nail production of the country. It may be said authoritatively that the big company has purchased the rod mill and wire and wire nail plant of the Shenango Valley Steel Co., New Castle, Pa., taking possession with the beginning of the new year. The rod mill has a capacity of 90,000 tons a year; the wire capacity is 75,000 tons; that of nails, 1,250,000 kegs. It is believed an arrangement has been made for billet supply, with the steel company. In any event that will be the natural source of supply for the rod mill, as the Shenango Valley Steel Co.'s bar mill will be, in the case of the American Tin Plate Co.'s New Castle works.

Another purchase of the week that is practically concluded is of the Oliver Wire Co.'s rod mill, capacity 90,000 tons a year, and its wire and nail plants, with capacity of 100,000 gross tons of drawn wire, 31,500 tons of barbed wire and fencing specialties and 960,000 kegs of wire nails. The connected steel plant of the Oliver & Snyder Steel Co., having two 5-ton converters, and Rosena Furnace at New Castle, Pa., belonging to the same company, are also included in the deal. The transfer of the Pittsburg Wire Co. was made last week. Wallace Rowe, Western Pennsylvania representative of the American Steel & Wire Co., succeeds Thos. Walker as president. The Washburn-Moen Mfg. Co. deal is not concluded, and the issue is not yet certain.

In connection with the acquisition of the Cleveland Rolling Mill Co.'s plant, which now seems assured, as the stockholders' meeting of Jan. 18 will certainly ratify what majority holders have already committed themselves to, it may be said that the basic open-hearth capacity at Newburg is likely to be considerably extended by the new owners. There is an increasing call for basic stock in rods and wire, in place of the Norway material heretofore imported.

What the new capitalization of the American Steel & Wire Co. will be is not decided; certainly double the present $24,000,000, half common and half preferred. An entire reorganization will take place when the new status is fully determined, and there is a rumor that the general offices may be established in Cleveland, in view of its proximity to the important plants. In the new stock deal, it is stated that 125 shares of new seven per cent preferred stock will be given for 100 of present preferred, and the common will be exchanged on the same basis.

1898 IN THE IRON TRADE.

The iron trade of the United States has just closed its books on the greatest year's business in its history. It enters upon 1899 in the confidence that yet greater things are in store. The fittest producers have made record-breaking tonnages with satisfactory profits. They look for an increase in both in 1899. Concerns that have done a large business in 1898, but without adequate profits, expect more satisfaction on this score when they are able to look back over 1899; for 1899 has had its position so far fixed by contracts already entered into, that prophecy is closely akin to history.

As 1897 was the beginning of an era of world-wide extension of American trade in iron and steel, such as had not been dreamed of under the old regime of defensive occupancy of home markets, 1898 is marked as the year in which the wedge has entered farther. It has established the fact that American producers are to be the dominating factor in the world's iron trade in the 20th century. It would dispel some old-world notions of the ephemeral character of this export business and old-world predictions of the readiness with which it will be given up when home demand overtakes home producing capacity, to know in detail of the strong influence that has been exerted in the American trade to keep down prices in the latter part of 1898, and that is still being exerted. The export trade has controlled in the fixing of ore prices, coke prices, pig iron prices, billet and tin bar prices. There has been no home demand as yet that has matched the enormous output of material from our furnaces. For, while pig iron stocks declined from 767,000 tons at the close of 1897 to approximately 50,000 tons at the close of 1898, indicating an excess of consumption, there were exports of iron and steel and machinery equal to 1,000,000 to 1,200,000 tons of pig iron. Meantime prices in Great Britain, which have been held down, as market reports from leading centers there indicate, by the fear that American iron and steel products will get a firmer foothold, may advance as the upward tendency is noted here, and this in turn may react on American prices to cause such an upward movement as leaders in the trade are now interested in averting. Prominent among export business for 1898 was the 80,000-ton rail order for the Trans-Siberian road and 32,000 tons of rails for Australia, all to be rolled at Sparrow's Point; and among rails shipments, large amounts from Pittsburg and Chicago for Japan, Corea, South Africa, and our neighbor on the north. The Maryland plant has shipped to Ireland, to Mexico and to India. The Australian plate order, of which the Carnegie Steel Co. has taken 33,000 tons, while the Illinois Steel Co. has been compelled to refuse the offer of the remaining half, was perhaps the farthest famed export business of the year, though the Pittsburg and Chicago mills sent considerable quantities of ship plates to Scottish yards, and an Eastern mill booked several thousand tons for Australia. Wrought iron pipe manfacturers made good records in their exports to the British Isles and the Continent, particularly to Germany, and cast iron pipe was sent from Philadelphia to Glasgow, while additional plant is projected for the Birmingham district, to pay special attention to the export trade in cast iron pipe.

Production and Prices.

It would appear, judging from the monthly blast furnace reports, the statistics of the American Iron and Steel Association for the first half of the year, and the fact that many furnaces have been making exceptionally large outputs lately, that the pig iron production of the year was not far from 11,500 000 tons, or nearly 2,000,000 tons above the best previous record. This will be increased in 1899 chiefly by the starting of new furnaces and the remodeling of present plants in the Central West. The Carnegie and Jones & Laughlins furnaces will become much heavier producers by the changes and additions now under way; the Lorain Steel Co.'s two stacks will be ready in April; the Ohio Steel Co.'s two monsters will probably be in blast in the latter part of the year, and the Union Iron Works, Buffalo, the sole foundry furnace of modern capacity that can be added to the lists, is expected to be active in the coming season. It is a noteworthy fact that producers of foundry iron, who early in the year tried vainly to get together for the cure of what seemed a ruinous and, under open competition, a persistent overproduction, come into the new year with order books running over and

even a scarcity of iron hinted at by some of them as a possibility in the first half of the year. It is evident that on the present conservative basis of prices no substantial addition will be made to the output of foundry irons. The statement below shows the active blast furnace capacity on the first of each month in the year, and in the right hand column the corresponding annual rate:

Date	Furnaces in Blast.	Weekly Capacity Long tons.	Yearly Equivalent, Long tons.
January 1	188	226,608	11,784,000
February 1	184	228,338	11,874,000
March 1	193	234,432	12,190,000
April 1	194	233,339	12,134,000
May 1	194	234,163	12,176,000
June 1	190	225,398	11,721,000
July 1	185	216,311	11,248,000
August 1	187	206,777	10,752,000
September 1	186	213,043	11,078,000
October 1	192	215,635	11,213,000
November 1	196	228,935	11,905,000
December 1	195	235,528	12,247,000

As has been indicated, the price basis on which the vast tonnage of 1898 was marketed was low, and fluctuations were few and narrow. Bessemer ores were advanced slightly over 1897, Norrie bringing $2.84, as against $2.65; Chandler, $3.13, as against $2.92½, and Chapin $2.56, compared with $2.40 in 1897. The shipments of Lake Superior ores for the year were in the neighborhood of 14,200,000 tons. Connellsville coke contracts were made in December, 1897, at $1.50 to $1.65; for 1899 the announced basis is $1 60. The output is estimated to be upwards of 7¼ million tons. The effect of the uncertainty preceding the war with Spain was seen in iron; but when fighting began orders for munitions kept many plants busy, and later vessel yards filled up with work. While exports fell off and stocks accumulated in the second quarter of the year, the signing of the protocol in August made that month as marked a turning point in the iron trade of the year as August, 1897, had been in that year, following the signing of the Dingley bill. The diagram on page 9 shows the course of average monthly prices on representative products in 1898 and the three preceding years. It does not show the highest and lowest weeks' prices, but the average of weekly quotations is taken for each month. The intersections of the traversing lines with the vertical lines indicate the price averages for the months for which the vertical lines stand. It is interesting to note the sharp peaks in the boom year 1895, and occasionally in following years a sudden plunge, indicating a disrupted pool. The even tenor of most of the lines for 1898 contrasts sharply with the wildness of 1895. The prices are all given for tons; beams, bars and tank plate being in net tons. The table of averages from which the lines for 1898 are plotted is as follows:

AVERAGE MONTHLY PRICES OF IRON AND STEEL PRODUCTS IN 1898.

	Jan.	Feb.	Mch.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Local 2 Fdy., Chicago	10.50	10.50	11 00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Gray Forge, Cincinnati	8.75	8.75	8.75	8.75	8.75	8.60	8.50	8.50	8.75	8.75	8.75	8 90
Plates, Chic ago	23.00	22.50	22.00	22.75	23.00	22.75	23.00	23.50	24.00	24.00	24.00	25.00
Billets, Pittsburg	15.00	15.00	15.25	15.85	14.85	14.75	14.75	15.45	16.10	15.75	15.25	16.00
Beams, Pittsburg	23 00	23.00	23.00	23.00	23.00	23.00	23.00	23 75	24.00	24.00	24.00	24.00
Bessemer, Pittsburg	9.90	10.15	10.40	10.50	10 40	10.40	10.35	10.40	10.40	10.30	10.20	10.65
Bars, Cleveland	20 00	20.00	19.50	20.00	20.00	19.50	20.00	20.00	20.50	20.00	20.00	20.00

In the table below, the prices at the beginning and end of 1898 and for the lowest and highest weeks of the year are given for the products represented in the diagram:

	Jan. 1, 1898.	Lowest week, 1898.	Highest week, 1898.	Jan. 1, 1899.
Local No. 2, Fdy Iron, Chicago	$ 10.50	$ 10.50	$ 11.00	$ 11.00
Gray Forge, Cincinnati	8.75	8.25	9.00	9.00
Tank Plates, Chicago	23.00	22.00	26.00	26.00
Billets, Pittsburg	15.00	14.65	16.40	16.65
Beams, Pittsburg	23.00	23.00	24.00	26.00
Bessemer Pig, Pittsburg	9.90	9.75	10.80	10.90
Bar Iron, Cleveland	20.00	19.00	20.50	20.00

The Consolidation Tendency.

While 1896 is remembered as the year of pools in the iron trade, and 1897 as a year in which the trade was generally free from their dominance, 1898 will be marked as a year in which great organizations were formed incorporating in one various companies that had been competitors. Of these the conspicuous ones are the Federal Steel Co., capital $200,000,000; the American Steel & Wire Co., capital $24,000,000, and the American Tin Plate Co., capital $50,000,000. All have had the distinction, such as it may be, of figuring prominently in Wall Street transactions, of the past few weeks, speculation being stimulated in the case of the second named company by its recent acquisition of other wire rod and wire plants and its plans for a more complete control of the production in these lines, together with steel plant for part of its needs of more than 1,000,000 tons of billets.

In price agreements, those of the producers of Lake Superior Bessemer ores on ranges except the Mesabi; of the merchant furnaces producing iron in the Mahoning and Shenango valleys, and of the six leading beam manufacturers of the country are practically all that remain. For eight months of the year a "gentlemen's agreement" on steel rails was in effect. On its termination in the fall, there was some selling at cut prices, and then an effort to organize a strong selling company with $1,000,000 capital to take all the output of the country. The Pittsburg interest finally refused to go into the arrangement, but the Western mills later came together on a basis of $17 Pittsburg and $18 Chicago. The enormous tonnage placed for 1899 has now raised prices $1 to $2 above this minimum. The few associations maintained in 1898 were conservative and have been considered successful. With the close of 1897 the revival of the beam agreement on a basis of 1.15c Pittsburg and including six mills was announced. In August $1 a ton was added, and with the beginning of the new year comes an announcement of $2 a ton advance in beams, or to 1.30c Pittsburg and of $1 a ton in angles, or to 1.15c Pittsburg. The Bessemer pig iron association of the two valleys, after a struggle of over six months established $10 at furnace in November, advanced it to $10.25 in December and to-day $10 50 is probably the lowest that would be quoted.

PITTSBURG IRON TRADE IN 1898.

During the year just closed a number of important facts in the iron trade have been established. The enormous increases in capacity for the production of iron and steel left doubt as to whether it was possible for a demand ever to develop which would satisfy it. The experience of last December proved that it was possible. It was doubted whether the exportation of iron and steel products could be continued after a fair measure of prosperity developed in the home trade, with attendant better prices, and it has been shown that even with unusually high ocean freights, and decidedly higher prices in the domestic markets, the export business has come to stay. The movement toward the harmonizing of competing interests has been shown to have an irresistible force, but the methods employed are undergoing a change, so that moderate prices with lowered cost of production is more sought for than high prices with increased cost owing to the carrying of dead weight. It is true the combinations lately formed have in general been largely over-capitalized, but the excess has been mainly in the form of common stock, on which dividends may or may not be paid.

While the production of iron and steel has been greater in 1898 than ever, indications all are that 1899 will far surpass this record. It is probable that new combinations will be formed in different branches of the iron trade, but there will be less tendency to carry dead weight and more attention paid to reaping the benefits of lowered production costs due to central management, the development of esprit de corps, and the comparison of costs in different plants which were formerly competitors and knew little of each other's affairs. The policy of including all processes from the raw material to the finished product under one ownership and head will find further application. The export trade will be increased not so much by putting prices at cost as by a closer acquaintance with the needs of buyers in foreign countries and a more thorough and methodical handling of the selling end of the business.

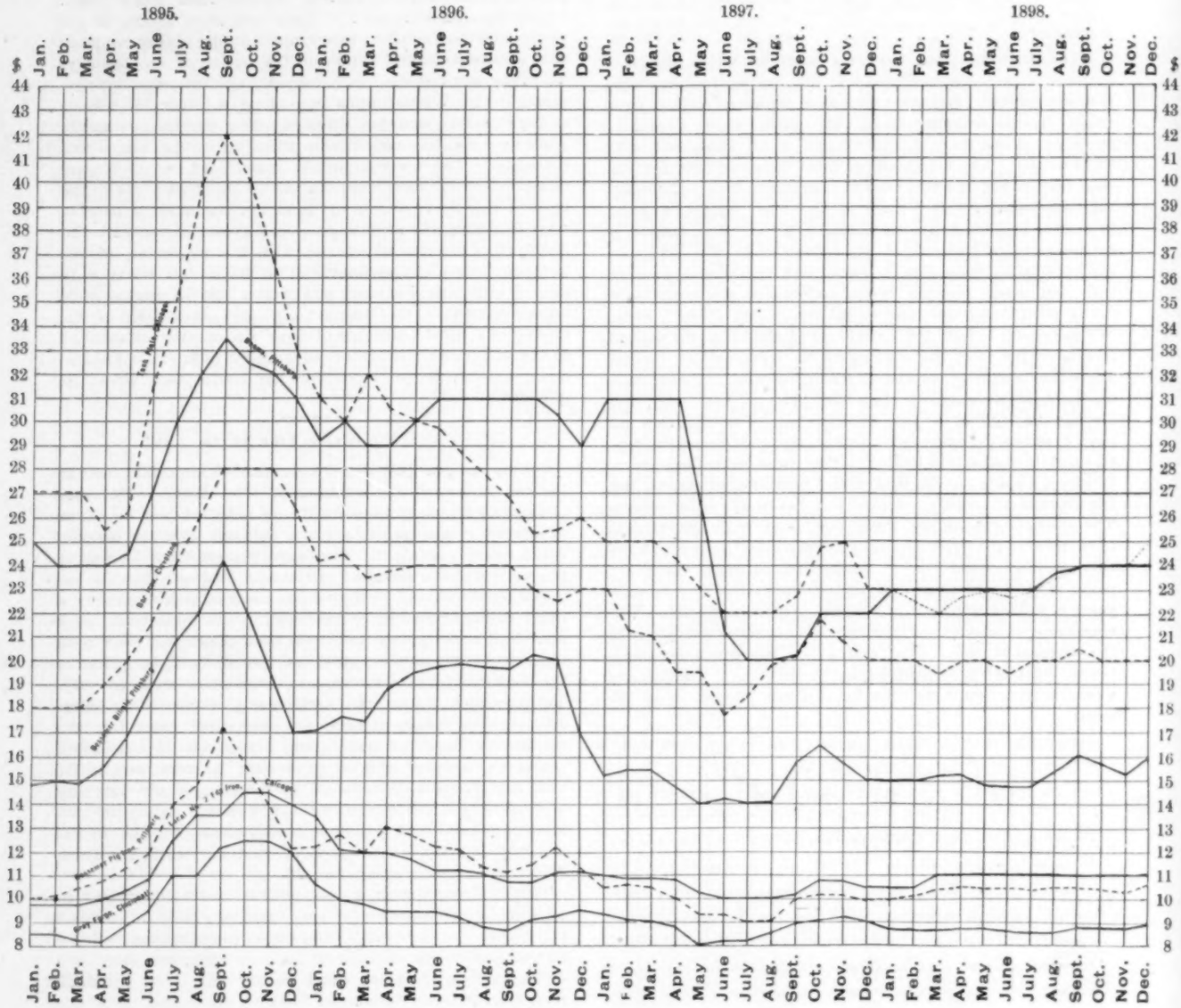
The opening of the new railroad between Pittsburg and the lakes has had a very important effect on freights, placing the Pittsburg district in a stronger position than ever before as compared with other iron producing districts in the United States, and with foreign countries. A ship canal to connect

the Ohio River with the lakes is no longer considered feasible or necessary. The improvements to the Ohio and Allegheny rivers, now well under way, in connection with the purchase by the Government of the locks and dams on the Monongahela River, open up wide possibilities of cheap transport of raw and finished material for the mills in the Pittsburg district, by providing cheap river freights and reducing railroad rates through competition.

Pig Iron.

Early in the year the leading Pittsburg interest purchased the two Carrie furnaces at Rankin, the output of which had formerly been sold in the open market. These furnaces, as well as the Edgar Thomson furnaces, will be remodeled to conform to the capacity of the Duquesne furnaces. The second largest interest, Jones & Laughlins, Ltd., is remodeling three furnaces and building a new one, and the four stacks will be the largest in the world. The steel producers are fast becoming totally independent of outside sources for their pig iron. It was the competition among independent valley furnaces which led to the efforts for concerted action early in the year. By the middle of March the association of valley furnacemen was formed and the $10 valley price announced. The year had opened with valley Bessemer quoted at $9.50, while it fell until early in February scarcely more than $9 could be had. During February prices advanced and when the $10 rate was announced, the market price went up to about $9.75. From outside sources the market was supplied right along, the iron coming from those who had previously made purchases, and from evasions of the letter of the agreement among the furnacemen. There was no time when an actual demand could not have been supplied at a price from 20 to 25 cents below $10, until at the end of October a new policy was adopted, with the appointment of a single selling agent, located in Pittsburg. No immediate improvement in prices resulted, but early in December a heavy buying movement started, which closed out all lots of outside iron, and the furnacemen then were called upon, thus establishing the price firmly at $10. The demand kept up and by the close of the year quotations were made ranging from $10.25 to $10 50, there being no desire on the part of furnacemen to sell at the lower figure. In foundry iron the market weakened toward the middle of the year, but rallied, closing much stronger than it opened. No. 2 foundry was quoted at $10 25 in the beginning of January, soon falling to $10, and in May going a shade below this. Later the market strengthened and the closing price was $10 50. Gray forge opened at $9, Pittsburg, and after a slight weakening in February, gained ground and reached $9.25 in April and May, and then after two or three periods of weakness reaching $9.75 at the close of the year.

DIAGRAM OF PRICE FLUCTUATIONS IN IRON AND STEEL IN 1895, 1896, 1897 AND 1898.


1895.
1896.
1897.
1898.
$
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8
Bessemer Pig Iron, Pittsburg
Bar Iron, Cleveland
Bessemer Billets, Pittsburg
No. 2 Foundry Iron, Chicago
Gray Forge, Pittsburg

Plates.

The whole year has been a good one for steel interests, even had there not been the sudden and wholly unusual demand for material in December, which forced prices up in a month usually characterized by declining values and lack of demand. With the economies effected by the large producers in control

of raw materials and large outputs, the price at which billets opened. $15 delivered Pittsburg, was a fair one, but the market strengthened until in March $15.50 was done, and it was not until June that prices under $15 were made. The low point was $14.75. At the same time sheet bars were decidedly scarce, and the weakening was in billets only. Toward the close of the year steel improved, and in December there was a strong upward movement, resulting in sales being made of considerable tonnage at prices equal to about $16.40 delivered, Pittsburg, with every indication of still higher prices early in the new year. Sheet and tin plate bars, between which there is now no difference, have ruled from $1 to $2 a ton above billets.

The remodeled and enlarged Bessemer steel plant of the Shenango Valley Steel Co., at New Castle, was put in operation during the year, the large bar mill not being completed until late, while the usual difficulties were experienced in starting it. It has a capacity of about 1,500 tons a day, half billets and half bars.

Plates.

The year was a prosperous one with the plate mills. Some very good orders were taken for export, and it seems plates will form a permanent part of our iron and steel exports. The steel freight car business has developed most rapidly. The main builder of these cars had a plant capable of turning out 20 cars a day, which was inadequate to the demand, and by the end of the year additions were about completed increasing the capacity one-half, while the Carnegie Steel Co. recently announced the intention to build a plant having a capacity of 40 cars a day. Each car takes from 12 to 13 tons of plates, so that probably close to 75,000 tons of plates were consumed in 1898 in making steel cars, while next year the consumption bids fair to be three times this amount. The market ruled steady at 1c during the fore part of the year for tank plate, while in the latter part of May an advance, which was claimed to be informal, was made to 1.10c, and by the end of the year 1.20c and 1.25c were quoted, with a decided scarcity.

Sheets.

The sheet trade has been the poorest of the prominent branches of the iron trade in 1898. There have at nearly all times been hungry mills which kept prices down even in the face of a moderately good demand. Several new mills have been built and some enlargements have been made to old mills, so that while there has been universal complaint it does not follow that the trade has been unprofitable. The manufacturers in their organization have made no serious effort to control prices. At the beginning of the year, No. 28 common was quoted at 1.95c, maker's mill. During January, the market strengthened some, but in February weakness developed, and heavy sales were made, so that late in the month 2c was generally quoted, with little business resulting. After a little slump 2c was again quoted, in the middle of March, but the market went down until in May 1.90c was freely quoted, and even specifications on contracts were difficult to secure. Then developed the talk of a shut-down for six weeks during the hot weather each year. The plan was almost put in operation, but the required number of votes to shut down did not materialize. As low as 1.85c was done in June, but the market later strengthened, and as high as 2c was generally quoted in September, although soon a weakness developed, and by the beginning of December sales were made considerably below 1.90c, to which price the market rallied, and at the close of the year lower than this could not be done while quotations from 1.95c to 2c were generally made by the mills. In December some very guarded efforts were started looking toward a betterment of the sheet trade but nothing had transpired by the end of the year, and the somewhat increased strength of the market was due wholly to the much stronger position of steel, which the sheet mills regarded as likely to be maintained.

Other Finished Materials.

The low prices in steel rails that prevailed in 1897 continued through 1898, the quotation for most of the first three quarters of the year being $18, Pittsburg, for standard sections. On some transactions there were lower prices than in the second half of 1897, and export business was taken at very low prices. In the latter part of September the understanding among the rail mills on prices was broken several low priced sales being made in the Central West. Then, after the organization of the Federal Steel Co., efforts were made, with much promise of success, toward the formation of a company to sell the product of all the rail mills, except one, which was to be given $250,000 to cease producing. This fell through and in the latter part of November heavy sales were made, some of them, owing to the sharp competition of the Lackawanna Iron & Steel Co for Western business, at $17 Pittsburg, but the greater portion at the equivalent of $18, Pittsburg. The Johnstown, Pittsburg, Chicago and Pueblo mills have had an understanding and have maintained prices except as against Eastern competition. It is understood that the leading rail mills are filled up well into the fall.

In wrought iron pipe there was sharp competition in the early part of the year but since mid-summer business has gradually accumulated and the mills have enjoyed fair prices. In the last week of the year an advance of 2½ per cent was made in view of the higher cost of raw material and the good demand ahead. The difficulty of getting material has been a regular complaint with customers of pipe and tube mills for some months. There was a good foreign trade in wrought pipe and the concerns establishing agencies abroad have been well repaid for their enterprise.

Structural material has been sold at agreed prices throughout the year. A meeting on Dec. 28, 1897, at Philadelphia, resulted in the formation of a pool including the Carnegie Steel Co., Jones & Laughlins, Ltd., Cambria Iron Co., A. & P. Roberts Co. (Pencoyd), Phoenix Iron Co., and Passaic Rolling Mill Co. The price was made 1.15c Pittsburg for beams and channels; this was advanced in August to 1.20c. Within a few days a further advance of $2 has been made. This was preceded by considerable sales to consumers who came into the market in view of advances in other lines.

Bars have had an uneventful year in respect to price, though the tonnage, chiefly from railroad, car works and agricultural companies has been unprecedentedly large. The general range of prices has been from 90c to 95c at mill in both iron and steel, and this has probably been the most stable material on the list.

THE CHICAGO IRON TRADE IN 1898.

The year just closed was one of the most remarkable, in many particulars, in the history of the iron trade. Its especially notable feature was the enormous tonnage of business, in connection with the range of prices, which were unprecedentedly low, with such a large demand for material. The year opened quietly, with no especially great activity in any branch of the market, but with great confidence on the part of the members of the trade in the prospects for business. Nearly all prices had fallen in the last two months of 1897, and at the beginning of the year were on a comparatively low scale. It was thought by many connected with the trade that not only would a large volume of business be transacted in the year, but that values would be very materially increased. Expectations in regard to volume were not disappointed. All classes of consumers were heavy buyers, their requirements steadily increasing with nearly every month, so that at the end of the year the rate of consumption of iron and steel products in the Chicago territory is larger than ever before. Consumption during 1898 has been fully 25 per cent larger, in this territory, at least, than in any previous year; and by far the greater part of the increase came in the last six months. Notwithstanding the large tonnage of orders placed, only moderate advances in prices of iron and steel were made. The history of the year shows no traces of a boom, or of any boom sentiment on the part of either buyers or sellers. Mills and furnaces inclined to the opinion that with moderate prices, and advances made only when the actual condition of the market warranted, a much larger and more profitable business could be done than with values so high so as to compel many consumers to make smaller purchases of material, and to enable out-of-date plants, with high manufacturing costs to overcome, to come into the market actively as sellers. Under the present range of prices only modern plants can manufacture at a profit, but all such can earn a fair return on the investment.

It was at first thought that the Spanish war might have a depressing effect on the market; and in the first few weeks it did cause some falling off in demand, particularly in construction lines. It appeared later, however, that the uncertainty of the few months preceding April 21 was more disastrous

than actual conflicts, particularly with the signal victories that came. The ultimate effect was undoubtedly beneficial.

Two important consolidation deals were engineered in the year. The first, made in March, resulted in the formation of the American Steel & Wire Co., taking in several of the most important wire and wire nail producers, and making a combination which controls about two-thirds of the capacity of the country in these lines. Since the original consolidation, other plants, of more or less importance, have been added, two of these being acquired in the past 10 days. The second important consolidation was that of the Federal Steel Co., with a capital of $200,000,000, taking in the Illinois Steel Co., the Minnesota Iron Co., the Lorain Steel Co., the Johnson Steel Co., the Elgin, Joliet & Eastern Railroad Co., and the Minnesota Steamship Co. The consolidation placed the constituent companies in a particularly strong position for economical production. The large scale of operations in the year has marked not only iron and steel manufacture in all lines, but all cognate interests. Agricultural implement works used a great deal more iron and steel of various descriptions than ever before, the output of such plants in this territory having been fully 25 per cent larger in 1898 than in the best previous year. Car works also used larger quantities of material than ever. Those in Chicago and vicinity, in addition to their large business in the year just closed, have orders on their books to keep them busy for from three to eight months in 1899. Bridge builders have been prosperous. Railroads have made extensive additions to their equipment in the shape of track additions and repairs, and in rolling stock. Machinery builders and engineering works have been busy, using large amounts of material, though not satisfied with their margins. Malleable works in Chicago and intributary territory have been fairly deluged with orders and for the past six or seven months their capacity has been plainly inadequate to the demand, though many enlargements were made in 1898. Some malleable plants have nearly doubled in the past year the output of any year between 1892 and 1897.

Pig Iron.

In January the pooling arrangement of the various Lake Superior charcoal iron producers, effected early in 1897, was dissolved. Pending the establishment of a common selling company, by three of the larger producers, and in the few months following very low prices were made, resulting in very considerable sales of charcoal iron to consumers who had been using coke iron for some time previous. All foun dry irons sold well throughout the year. The demand was much more than sufficient to take the entire foundry iron output of the local producers, and consequently charcoal furnaces and Southern coke furnaces were able to increase their sales largely over 1897. The range of values was fairly steady. Prices of local coke irons have been unchanged since March on a basis of $11 for No. 2 foundry. In that month the only advance of the year was made, from $10 50. Southern irons have shown somewhat more fluctuation, ranging from a low price of $10 for No. 2 foundry, in July, to $10.85, quoted at the close of the year. This is an advance of 50 cents over the year's opening price. In the early part of the year an attempt was made to make a pooling arrangement of the Southern producers, but it was only partly successful, as it included finally only the larger furnace companies, the smaller ones staying out and making an open market practically. There was no other pool proposed in the year. The local furnaces were in blast steadily, with the exception that Iroquois Furnace was out of blast for several weeks in the early fall for necessary repairs.

Foundry interests did a larger trade last year than ever, as evidenced by the large amount of foundry pig iron sold. The increase in the trade has been steady throughout the year, and during December the consumption of iron by foundries in this territory was at a rate never before approached. Malleable foundries, as indicated above, used much more iron than ever in the history of that trade, being totally unable, for some time, to take care of all the business offered, notwithstanding their numerous and large additions. The month of December was remarkable for the amount of pig iron sold, the record for the closing month of the year being far exceeded. In two weeks sales amounted to over 100,000 tons; and the remarkable part of it was that few sales were divided among so many customers. Inquiries from consumers came in so rapidly that it was almost impossible for pig iron dealers to handle the business. This was caused partly by the fear on the part of the buyers that prices would be advanced within a short time, and partly because there is an apparently well founded belief that there will be a considerable shortage in iron of foundry grades before the middle of next year. As a consequence of the large sales made in December, prices of Southern irons were advanced 25 cents a ton, and further advances may be expected within a short time.

Finished Material.

The year has made a most extraordinary record in the way of sales. These have been without precedent, in most lines and have increased steadily from January to December. It is remarkable that while orders have been so large as to keep mills busy for the entire year, and in many cases business has been turned away, prices have fluctuated but little. The best equipped mills have shown a desire to secure as large a tonnage as possible, at fair prices, rather than be satisfied with smaller business, without steady operation, even though the latter would give larger profits per ton. In bars, with a heavy business, prices have been relatively lower than on other products. Bar iron has sold from a little less than one cent to as high as 1.10c in the year. Attempts have been made at various times in the year to form a pool of the bar mills, and several meetings were held, but nothing of consequence resulted. In rails large sales were made in January and business from then on was sufficient to keep the mills fully occupied throughout the year. Prices were maintained, by means of an agreement, at $20 a ton until September, when the withdrawal of one of the largest members was announced. During October and November efforts were made to get the rail makers together again, and numerous meetings were held with that object in view. Prices were withdrawn, and no sales of standard section rails were made. Finally, in December, arrangements were perfected whereby the Carnegie Steel Co., the Federal Steel Co., the Colorado Fuel & Iron Co., and the Cambria Steel Co. became members of an agreement to maintain prices, leaving the other rail makers out. Prices were set at $17, Pittsburg, $18, Chicago, and $20, Pueblo. Railroads had been endeavoring for some time to make purchases, and with the announcement of prices large sales were made. Structural material sold exceedingly well all through the year. A large business was had from railroads in particular. There was comparatively little building, only a few large contracts being let, but general business was most excellent, keeping the mills running full. The elevation of tracks in Chicago and Drainage Canal work were large factors. The new Chicago postoffice will take a large amount of material, also. The production of the local mills in billets and rods is largely used in material of higher finish in their own mills. As a consequence the sales of billets and rods by the local mills were no larger last year than in previous years. Outside mills made considerable sales, however, and the total of orders placed in this territory was beyond the record. In plates, business has been very large, a good tonnage coming from ship builders, who have had an excellent business. Other consumers also took good quantities, and the capacity of the mills has been seriously taxed to keep up with the amount required by buyers. Altogether the year has been most satisfactory to both buyers and sellers.

The range of prices in the year is shown in the appended table of average prices for each month on the leading forms of iron and steel. It does not show necessarily the highest or lowest points touched, but the average, month by month, as computed from weekly reports:

MONTHLY AVERAGE PRICES OF IRON AND STEEL, CHICAGO, 1898.

	Jan.	Feb.	Mch.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Lake Superior Charcoal Iron	12.25	11.50	11 75	11.00	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50
Northern No. 2 Fdry	10 50	10.50	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Southern No. 2 Fdry....	10.35	10.35	10.35	10.35	10 35	10.20	10.10	10.25	10.60	10.60	10.60	10.75
Bar Iron.....	21.00	21.00	20.50	21.00	21.00	21.00	20.50	21.00	21.00	21.00	21.00	20.00
Rails.....	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	19.00	.....	.....	18.00
Beams.....	26.00	26.00	26.00	26.00	26.00	26.00	26. 0	26.75	27.00	27.00	27.00	27.00
Tank Plates....	23.00	22.50	22.00	22.75	23.00	22 75	23 00	23.50	24.00	24.00	24.00	25.00
Billets.....	17.25	17.50	17.35	16.75	16 25	16.00	16 00	16 00	16.75	17.00	16.50	17.00
No. 27 Sheets...	44.00	42.50	41.00	40.25	40.00	39.00	39.00	40.00	41.50	42.00	40.75	39.50

Changes in Illinois Steel Co. Officers.

The much talked of changes in the officers of the Illinois Steel Co. were announced last week, in part. President E. H. Gary, of the Federal Steel Co., was in Chicago last week, and made the announcement on Saturday. The resignation of John W. Gates as president of the Illinois Steel Co., presented some time ago, takes effect Jan. 1, and Eugene J. Buffington, treasurer of the American Steel & Wire Co., has resigned that position to accept the presidency of the Illinois Steel Co. The resignations of William P. Palmer, second vice-president, W. A. Green, secretary, and A. M. Crane, sales agent of the Illinois Steel Co., have been presented and accepted, to take effect Jan. 1. No announcements have been made as to the men who will be appointed to fill these vacancies as yet, but the appointments will be made in the near future. Messrs. Palmer, Green and Crane have accepted positions with the American Steel & Wire Co. Mr. Crane becomes general sales agent of that company, the appointment to take effect at once. It is stated that Mr. Gates will also take an official position with that company, although no announcement has been made of his future intentions.

It is announced that W. A. Green has been elected treasurer of the American Steel & Wire Co.

FLUOR SPAR IN THE BLAST FURNACE.

BY DR. RICHARD MOLDENKE.

The growing demand for fluor spar in metallurgical processes has brought many inquiries regarding its value in the blast furnace. It is difficult to give a precise answer thereto, for very few records are available. In these days of forced production, however, every point counts, and if the use of fluor spar in the blast furnace results in either a decrease in the fixed charges for making pig iron or in giving a greater fluidity to the slag, with incidental chemical benefits, at a cost no higher than the present, the time and trouble taken to establish this will not have been wasted.

The published records seem to indicate that fluor spar was a regular admixture with European blast furnaces in former days, the comparatively cheaper limestone eventually superseding it in everything but the production of ferromanganese and ferrosilicon, where the chemical reactions it gives rise to make it highly desirable. From this we would judge that so far as the lining of the blast furnace is concerned a moderate addition of fluor spar would not hurt it, the increased fluidity of the slag keeping the lining clean and freer from obstructions than would otherwise be the case, a fact borne out by daily cupola practice where the continued use of the proper amount of fluor spar is a real advantage in every way.

While fluor spar is about ten times as energetic in its action as limestone, one point must be borne in mind, and that is the amount of slag required to keep a furnace in good working order. Here we have the root of the matter. If it is necessary to have a given quantity of slag to run properly, then we cannot take advantage of the powerful action of the fluor spar to the extent that we would like. This seems to be the case in actual practice, and the question would arise what are the benefits a moderate use of fluor spar would bring about? First of all, an increase in the fluidity of the slag, then an enrichment of the bases in the slag to the extent of about 10 per cent, and finally a dephosphorizing and possibly also a desulphurizing action on the pig produced.

That the extra fluidity or livening up of the slag is an advantage, goes without saying; the chances for scaffolding are reduced greatly, and an even working on the part of the furnace is more likely. The amount of mill cinder usually added will be taken care of better and will not accumulate with damaging results to the pig iron, so far as its phosphorus contents is concerned. In the preparation of basic iron, so much called for nowadays, the addition of fluor spar allows a lowering of the high temperature necessary to render the slags produced fluid enough to handle properly, and this in turn means lower silicon in the pig. This is an improvement, for with direct metal from furnace to converter there is no need of the high silicon formerly necessary to properly blow a heat of pig iron remelted in a cupola.

The recent experience of a furnace in the Shenango Valley, which got over a severe case of scaffolding by blowing several hundred pounds of fluor spar through the tuyeres, would show that it is very useful in emergencies.

The best plan to pursue in using fluor spar in the blast furnace would be to follow cupola practice to some extent, beginning with one-tenth of one per cent, and gradually increasing the amount as the results obtained may indicate.

THE *Railway Age* statistics of new railroad building in the United States in 1898 show 3,018 miles, as against 1,880 miles in 1897; 1,848 miles in 1896; 1,803 miles in 1895; 1,949 miles in 1894; 2,635 miles in 1893, and 4,192 miles in 1892.

THE Milton Iron Co., Milton, Pa., is fully employed, with good prospects of steady work for some time to come. Improvements are contemplated which will materially increase the output.

THE American Pipe Co., Chattanooga, Tenn., is introducing a new process of drying molds. This necessitates the changing of ovens and hereafter the molds will be dried by hot, instead of cold, air.

THE Turner Engineering Co., of Marion, O., with plant at Bucyrus, O., recently voted to increase its capital from $50,000 to $100,000.

LAKE SUPERIOR IRON MINES.

The recent advances in wages at Vermillion and Gogebic mines bring these two ranges practically on a par in the matter of miners' pay. Marquette range mines have paid more than either for several years, and the advances only put the others on a par with it, and in some cases perhaps leave Marquette miners still somewhat above those at Vermillion and Gogebic properties.

The Duluth & Iron Range Railroad has given the contract for tearing down and rebuilding ore dock No. 1 at Two Harbors. In addition the company will dredge the harbor, and build five miles of new line from Waldo to Two Harbors, also erect three new stations and improve the grade on the entire line, giving better time and heavier trains.

The Edward P. Allis Co., Milwaukee, says that there is no truth in the reports recently sent broadcast that it intends to build blast furnaces and smelt ores taken from its own Vermillion range property. The Allis company has owned for a long time ore lands in Minnesota. Leased lands of the company are in township 63, range 12, about two miles east of Ely, Minn. Included in the lands are 80 acres in the northwest quarter of Section 25, adjoining the late acquisition of the Oliver Mining Co., the Savoy.

The lease of the Norman mine, a Minnesota Iron Co. property, at Virginia, Minn., has been acquired by the Oliver Iron Mining Co. Giles Gilbert and others are the fee owners and the royalty is 20 cents with a minimum of 50,000 tons. The Norman is not an important property. All its product has been non-Bessemer with the exception of a small amount of Saxon ore which analyzes 64.29 in iron, .039 in phosphorus and 8.90 in moisture. The average of cargo analyses of the Norman in 1897 was 61.98 iron, .067 phosphorus and 10.40 moisture. The mine has shipped 421,000 tons, of which 110,000 ons was mined in 1898. It was acquired not so much because the Oliver company wanted its ore as because of its proximity to the Lone Jack and the desirability of getting at the latter deposit through the Norman.

Some changes in sales agencies of Lake Superior ores have been made for 1899 and others are in prospect. The Newport will be handled by M. A. Hanna & Co., who have had the Dunn and Palms, other Schlesinger ores. The Queen, which Oglebay, Norton & Co. have had the past year, has not been definitely placed for 1899. The lessees of the mine, Corrigan, McKinney & Co., have not yet perfected arrangements with the fee owners for a resumption of operations.

THE foundries of Cleveland, in which core-makers' wages were advanced some months ago from $2.25 to $2.50 a day as a minimum, on the demand of the core-makers' union, posted a notice Dec. 1 that after Jan. 1 the minimum wage should be $2 a day. The core-makers had been planning to resist the reduction and decided last week to go out. The advance was granted last summer when some of the shops were busy on Government work and others were crowded with special contracts. It was felt at the time to be unjust, by the nine strictly union works granting it, particularly in view of the rates prevailing in other cities. Before this advance was made, the foundrymen claim, Cleveland core-makers were paid a high rate. Figures collected from other cities by Secretary Penton, of the National Founders' Association, showed minimum wage of $2, $1.75 and even $1.50, none being as high as the Cleveland price. The foundrymen contend that skilled core-makers, earning even as high as $2.75 under the present Cleveland minimum, will earn it under the proposed arrangement, but they object to paying the highest wages in the country to men of only moderate efficiency. The figures gathered from cities in which the National Founders' Association is represented show an average minimum wage of $1.68 and an average general wage of $1.94.

THE Watts Steel & Iron Syndicate, Middlesborough, Ky., will make considerable improvements, in the next three months, including the installation of new shears, electric crane, patent equipment for handling iron direct from furnaces, new soaking pits, etc.

THE Bristol Brass & Clock Co., Bristol, Conn., is making extensive additions and installing new engines, shafting, etc.

Review of the Technical Press.

[Translation, Condensation and Comment expressly for The Iron Trade Review by Dr. Richard Moldenke.]

The Effect of Silicon on the Magnetic Permeability of Cast Iron. [*Electrical World*, Dec. 10.]—Prof. Caldwell gives a brief summary of results obtained by testing several varieties of cast iron with varying percentages of silicon for their magnetic permeability. As this subject is of importance to the founder who makes dynamo castings, a summary of the results attained is given below. There are two conditions which must be taken into consideration: First that the castings produced are of the proper physical character and can withstand the continuous heavy strains and vibrations incident to the use they are intended for; and secondly, that they be at the same time as permeable to the magnetizing force as possible. If a bar of iron is wound with insulated wire from end to end evenly and a current allowed to pass through this wire, the bar becomes magnetic. To express this condition numerically, the number of magnetic lines of force per unit of area of a section near the middle of this bar are given. In electrical parlance, this is designated by B. It is obtained by trial in each case and varies considerably, depending upon the strength of the magnetizing force. Thus, for an iron in which for a certain strength of magnetizing force B becomes 5,000, this will not become 10,000 when the force is doubled, but will fall short considerably. It is important, therefore, to use irons which will allow the application of a maximum of magnetizing force with efficient results. To return to the subject matter: Prof. Caldwell had the tests of the magnetic permeability of two Bessemer irons and a Southern variety made at the Ohio State University. The silicon in the Southern iron (Rockwood) ran from 1.87 to 4.27 per cent in 11 casts. One of the Bessemers ran from 1.82 to 4.62 per cent in 14 casts. Curves were constructed from the data obtained and from these curves the magnetizing forces necessary to give densities (B) of 2,000, 5,000, 7,000 and 8,000 were obtained, and were again plotted in connection with the silicon percentages. The conclusions derived from the above were that the specific opposition to the magnetizing force on the part of all the irons tested decreased as the silicons rose from 1.8 to 4.6 per cent. For low densities, that is, where B is low, this decrease is proportional. Where B is up to 8,000 a silicon contents of 3.5 per cent seems to be the limit for good efficiency and hence should not be exceeded. As a matter of fact it would be unsafe to exceed this silicon contents anyhow, for the shrinkage strains set up would make such castings very dangerous when subject to centrifugal force.

The Corrosion of Rivet Heads.—*Dingler's Polytechnisches Journal*, reviews this subject and quotes among other references the work of Dr. Walter as published in the *Chemiker Zeitung*, of Oct. 12. There are a number of theories extant which endeavor to account for the corrosion of rivet heads in boilers, tanks, etc. It is a well known fact that the heads of rivets show much greater evidence of corrosion than the plates that are held together with them. One explanation advanced to account for this is that steam is generated faster at the rivet heads and the film of oxide which coats the iron is continually destroyed. Unfortunately for this theory the facts do not bear it out, as the rivet heads of tanks not exposed to heat go just as quickly as those which are. Another theory to cover such cases as riveted steam pipes, tank covers, etc., supposes that the radiation of heat from the rivets is stronger than from the main body and hence moisture collects on the rivet heads, and drops form at the under side, which mean eventual destruction. In the case of the interior of feed water heaters the dissolved air separating from the water is supposed to oxidize the projecting heads. Dr. Walter has shown that the action of steam is similar to a sand blast and may even produce perforations; and another theory is based upon this fact, but would seem improbable in all but extreme cases where the steam can impinge upon a rivet head directly and with considerable force. Again the scouring action of suspended matter is supposed to account for most of the trouble. All these theories may have some foundation in fact but are not conclusive enough to satisfy those conversant with the subject. For instance, the experiment was made of filling an open tank with brine and the rapid corrosion of the rivet heads noted when it was left to stand cold, while no action resulted in another tank in which this brine was boiled. Again another tank was used for boiling a strong solution of sal ammoniac with the result that the rivet heads in it were eaten off completely while the plates were but slightly affected. Dr. Walter explains this occurrence as follows: The tank steel and the rivets are of a slightly different composition; this difference is sufficient, however, to cause a very weak current of electricity to be set up, leaving the rivets electro-positive to the balance of the tank. Electrolysis results, the rivets go, and actually protect the plates. The final suggestion is made that galvanometric measurements be made to learn something definite along this line of investigation and doubtless much of value will result.

Progress in Tin Plate Manufacture. [*Tin and Terne* Dec. 1.]—"Fer Blanc" reviews the progress made in the manufacture of tin plate since it was made a commercial success in this country about seven years ago. As was to be expected, the slow and cumbersome methods of Wales were subjected to the searching scrutiny of American minds with the usual results and there remains now only the inevitable struggle with organized labor which must be brought to understand the laws of supply and demand until the tin plate industry gets to a point where the business of the individual mills becomes practically a question of freights alone. As "Fer Blanc" says, the increase in output is up to the limit allowed by the workingmen's associations, and could be considerably increased so far as the possibilities of the equipment are concerned. The general improvements noted are in nearly all departments. The heating furnaces have been enlarged and increased in number, the heat is distributed evenly and the steel heated quicker, which means less wasting; less scrap is produced and the rolling is easier. The rolls are now very much larger than formerly, 26-inch rolls of considerable length being now quite common. Intsead of having one stand of rolls do both roughing and finishing, a separate stand of rolls is now provided for roughing, which furnishes enough material to supply a stand of finishing rolls on each side. The engine arrangements are also undergoing a change, slower speeds for the mills allowing transmission arrangements involving smaller high speed engines. How this change from an ideal moderately speedy Corliss engine equipment will work out, especially the rope drive transmissions now being introduced, will be well worth watching. The doubling shears are now better constructed, the rolls can give a better account for themselves than formerly, and the packs are now sheared by gauge instead of requiring a preliminary marking out. One of the principal improvements was the introduction of the three-motor electric traveling crane, which no mill, in which it is possible to install one, should be without. After all, when one looks up the time cards of an actively driven mill and notes the expenditures for labor in simply moving about machinery and work, the cutting off of a half dozen laborers will make a traveling crane pay for itself the first year, not to mention the time gained all around. Large and efficient picklers are now in use in all the tin plate mills, while in annealing steel plate built-up boxes have replaced the old cast iron ones. For annealing the packs better types of furnaces are now used. Here as well as in the iron trade generally, the improvements looking toward a better distribution of heat, the use of producer gas in place of coal direct and when the superior natural gas is not available, have made the older types of furnaces and ovens obsolete. One point on which there is great progress to be made yet is the charging and withdrawing apparatus. In the cold rolling departments the progress has been rather in a line of saving labor between the machinery and re-arranging this than in the improvement of the machinery itself. The tinning machines are now made with very long rolls and the black plates are fed side by side instead of one after the other as formerly, hence one man can now get out nearly twice as much work. There is still much to be done in the way of improving the small items about the machinery and processes. One of these points has been taken up by Mr. Donner and is described in the issue of Dec. 15 of *Tin and Terne*. "Fer Blanc" goes into the rationale of rolling tin plate at some length, showing how an otherwise perfect roll can be quickly broken by irregularity in expansion due to sudden heating.

If, now, a roll can be heated gradually and then be kept at this temperature constantly the greatest part of the difficulty will be overcome. Thus where the same stand of rolls does the hotter roughing and the cooler finishing there will be continual fluctuations in temperature which are avoided altogether by providing separate stands of rolls for each operation. The improvement made by Mr. Donner is one of process, for he provides five stands of rolls and arranges the process so that two of them take the roughing between them; the other rolls always get the same class of sheets to work upon and thus each roller or catcher will always handle either the bars, pairs, fours, or eights, get proficient in these lines, and the rolls get the same size sheets with the same temperatures all the time. In this way the process becomes continuous, bar after bar being rolled and finished without intervals of time as in the old method. The reader is referred to the original article for the full description, this much being given to show that a little systematizing results in better work, less waste, greater outputs, and smaller wear and tear to the machinery and men, and should therefore be carefully looked into in all manufacturing plants.

FOUNDRYMEN ON PIG IRON GRADING.

An interesting discussion followed the reading of Dr. Phillips' paper entitled "The Yard Grading of Pig Iron," at the meeting of the Pittsburg Foundrymen's Association, Tuesday night, Dec. 27. Dr. Moldenke opened the discussion by stating that Dr. Phillips left out the question of the temperature of casting at the blast furnace, holding that this would affect the fracture, by affecting the quantity of combined carbon, the hotter the iron the more of the carbon remaining in the combined state. Then again, Dr. Moldenke wanted to know how the pieces were sampled for the analyses mentioned in the paper, because the amount of combined carbon would be different at the center and edges. He mentioned that for three or four years past he had bought iron on analysis, and found that the furnacemen liked the arrangement once they got used to it. In malleable iron, which is his specialty, there are 18 distinct grades, six general grades with three divisions in each.

Dr. Phillips replied that they had had a great deal of trouble in sampling. The method adopted was to put the pig in a sort of trough, and bore right through from one edge to the other side, thus getting borings from edges and center. There was difficulty in getting borings free from sand, and to obviate this the surface was chiseled to remove the sand before boring. The drillings were afterward gone over with a magnet to remove the iron from the sand. He agreed with Dr. Moldenke that it would be better to go by the total carbon than just the combined carbon, but the determination of total carbon is much more difficult than of combined carbon. In a furnace making 200 tons a day there would be four casts of 50 tons each, and there would be a constant swinging from the beginning to the close of each cast, and there may be the whole 13 grades in a single cast. This is unfortunate, but it cannot be helped, and the iron must be graded some how in order to sell it, the main question being, shall the grading be done scientifically? He defended the plan of determining the combined carbon for grading purposes, because it would permit of differentiating between soft irons not foundry irons and those which are foundry irons.

Dr. Moldenke here called attention to the fact that the size of the pig makes a difference in the fracture, while chemical grading would not be affected by the size of the pig.

Mr. I. W. Frank, of the Frank-Kneeland Machine Co., gave his opinion that the determination of the total carbon was very important in grading, saying that certain furnacemen sell on the total carbon, and make a strong point on it. The total carbon affects the softness. The matter of sampling is one much discussed. The buyer's analysis always shows lower silicon than the seller's, the latter generally including some sand, so that the question how the iron was sampled is a very important one. Mr. Frank held that if there was a decided call for it, the chemist would be able to work out a quicker means of determining total carbon than by the combustion method, which would answer the objection made that total carbon determinations took too much time for blast furnace work.

To a question of Dr. Moldenke's whether the total carbon varied much in a day's run at the furnace, Dr. Phillips replied that they had found it did not, the variation being not over one-fourth per cent in the day, but the combined carbon would vary even from one end of the pig to the other. This variation was due to the endeavor to get very large outputs, the iron not being permitted to lie in the furnace long enough, it being due in part also to the limy ores used in Alabama.

Mr. E. A. Kebler stated that he found little complaint as to variations in silicon in the irons he sells as graded the same. He thinks we should look beyond silicon, and go more for the general analysis. There has been an advance in chemistry which has helped the grader in his work. Many customers do not care for analysis, they simply let the furnaceman grade the iron to suit the work in their foundries. It is wonderful how much the appearance of the fracture shows, when one has the chemical analysis to go by. He mentioned a case of a furnace which had been casting in small pigs, the fracture showing a close grain. Then the furnace changed to a pig three times as large, which gave a much more open grain, and now the iron is easier to sell.

Dr. Moldenke here said that the National association ought to take up the question of having chemistry help in the grading of pig iron, and that the Pittsburg Foundrymen's Association ought to bring the matter up for the next convention. The Pittsburg association had already started interest in two subjects which had caused a great deal of discussion. The members here indulged in a general discussion of the best manner of bringing the matter before the convention, among other points discussed being the fact that unless the matter were put in very tangible form there was danger that nothing definite would be done at the convention, and also that it would be well if the matter were mentioned in the notices sent out in advance of the convention so that members would come prepared for a discussion. Finally a motion was put in writing and passed, to the following effect: "Resolved, That the Pittsburg Foundrymen's Association recommends to the American Foundrymen's Association the adoption of standard methods of grading pig iron for foundry purposes, and that our representative be requested to bring this matter before the executive board for action." It was the sense of the meeting that Dr. Phillips head the discussion in the matter at the convention. Mr. I. W. Frank is the Pittsburg representative on the executive board.

Two gentlemen, whose names had been favorably passed upon, were admitted as members: S. H. Stupakoff, of the Union Switch & Signal Co., and James Kelley, of A. H. Childs & Co., pig iron brokers.

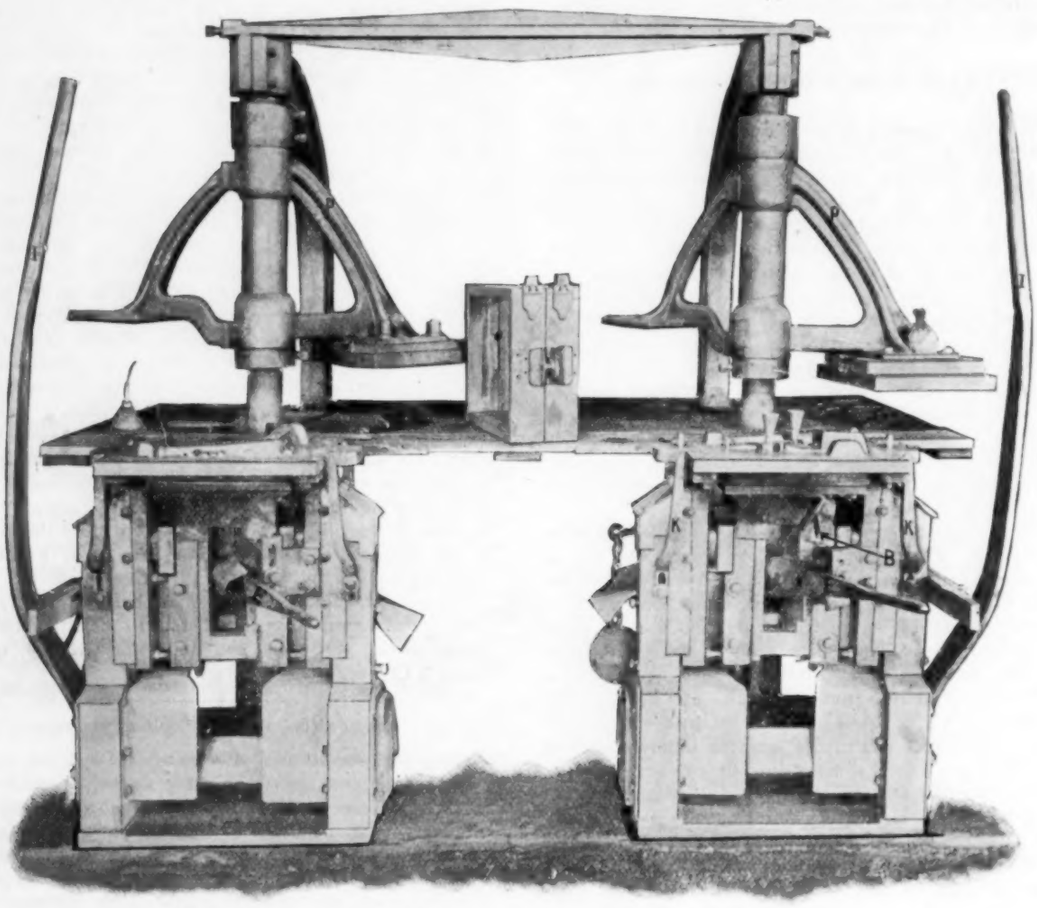
An Economical Power Plant at Homestead.

The power plant which will furnish most of the steam for the universal plate mill which the Carnegie Steel Co. has nearly completed at Homestead will embody a reduction of manual labor to the minimum. There are 16 250 h. p. Cahall boilers, making a total of 4,000 h. p. in the building. The coal is fed steadily into the furnaces by a system comprising a slowly moving bed composed of grate bars extended between endless chains which are supported within and without the furnace by gear wheels which rotate. Thus an even bed of fuel is gradually introduced into the furnace and advanced further as combustion progresses. The whole framework supporting the gears, chains and grate bars can be readily withdrawn for inspection and repairs. The quantity of fuel is regulated by a plate extending across above the grate bars at the entrance to the furnace. The ashes will be removed automatically. The feed pumps are regulated by the height of water in the boilers, which height is maintained steady within half an inch. Three men only will be required to attend to the 4,000 h. p., these being machinists who will see that the machinery remains in good order, one for the coal feeding apparatus, another for the pumps, and another for the ash removing mechanism.

THE Slaymaker-Barry Co., South Connellsville, Pa., has just moved into the newly completed buildings that take the place of its plant that was burned early in 1898. Hardware specialties are manufactured. The new plant is equipped throughout with improved machinery.

THE POOLE MOLDING MACHINE.

Lorenzo Poole, of Belvidere, Ill., is the inventor of a molding machine shown in the accompanying illustration. It may be operated by one, two or three men, according to the quantity of castings wanted from one pattern. The drag is made on one side and the cope on the other. The cut shows the machine with patterns attached. Bands are used to take the place of a flask when the molding is completed. The pattern on the machine is a sewing machine arm; and a description of the method of making one will give an idea of how the machine is generally used when the pattern is of the stripping plate variety. On the left hand side is the drag; on the right side is the cope, which has runner gates and sprues connected. On the cope side it will be noticed that the spooler lug G is set at an angle of about 45 degrees. In hand molding it is loose on the pattern and has to be drawn separately; but on the machine it is drawn independently by the lever L. In working three men on the machine two pairs of flasks are used and operated by two helpers and a core-setter.



THE POOLE MOLDING MACHINE.

Helper No. 1 puts his half of the flask on the drag side; drops a band in the flask; riddles in sand to fill the corners around the pattern; fills up the flask with a shovel; strikes off the surplus sand; digs out a little over the high parts of the arm; lays on the sand a bottom board which is small enough to go inside of the flask; and then swings around the presser-board so that it will come over the mold. He then pulls the long lever I forward. The center of the machine with the flask goes up, and drives the bottom-board into the flask until sufficient hardness is secured; then the lever I is let back to the starting place and press arm is swung out of the way, and the lever E pushed down. This draws the pattern down through the stripping plate. Then the mold is taken from the machine and put on a table, being turned over in the operation.

While No. 1 is making the drag, No. 2 is at work on the cope, which is made by dropping the band in the flask; riddling on sand, shoveling in sand and striking it off as in making the drag. Then the press arm P is swung over the flask, for on this side the press-board is secured to the arm and the board is made to go inside of the flask, as with the drag, by pulling the lever I forward and sending the flask up, until the mold is hard enough. What remains is to push back the small lever, and swing back the press board; pick out the two sprues; push down the small lever L, which draws the lug G. The hand drops from the lever I to the lever E, pushes the latter down and the mold is ready for the core-setter.

As soon as the first helper turns his half on the table, the core-setter sets in the cores and turns to the cope, takes it from the stripping-plate and closes it on to the drag. He then removes the flask, which is of the snap variety, and puts it on the table in the center of the machine; turns back and vents his mold at the large end of core, and sets the mold out on the floor. Then he turns to his table and finds a drag waiting for him which No. 1 was making while he was setting the core and setting out the mold. This shows why two pairs of flasks are needed to set out the molds rapidly. The helpers are making the second mold while the core-setter is finishing the first, etc.

The center part of the machine is counterbalanced as a whole, and the lever E which carries the patterns is counterbalanced independently, making the operation of the levers a matter of movements, rather than of strength. The inventor, after working on molding machines of various kinds for 18 years, has sought to overcome in his machine the drawbacks of the hard-working hand press varieties, as this machine will easily press as large a mold as two men can handily carry off.

The overhanging arm which supports the arbor for the press boards—and also the arm for a peaner when necessary—is braced in such a manner and so connected to the center of the machine at the back, that the machine when pressing a mold pulls against itself, the mold being between. The hardness of the mold being reached at the closing of a toggle joint

gives a very powerful press when operated by such a long lever.

The principal parts run in adjustable oiled bearings, which are constructed and aproned in such a way that the bearings are practically sand-proof. The bearings are adjustable to natural wear.

The machine is adapted to match-plate work as well as to stripping plates, the lever E not being used for the latter class of work. Any pattern that will allow of the slightest draft can be made on this machine, without the stripping-plates, although the stripping-plate is not so expensive to make since it can be made with two kinds of metal.

In making a mold on a match plate, the flasks are used in the manner described. Bands are used or not, as the weight of the casting calls for, and the mold is pressed in the same way; but the lever when it is back to its starting position is let still farther back, causing the center part of the machine to settle down on each side. At the end of the flask are flask-catches K which engage shoulders on the flask as the middle settles down. These catches coming directly under these shoulders engage them and the flask stops and is held, while the pattern with the center part of the machine still recedes, drawing the pattern from the mold and leaving it on the catches K.

The machine has never been put upon the market, but has been built for a few shops. The National Sewing Machine Co., of Belvidere, Ill., and the Knowles Loom Works, of Worcester, Mass., are two important concerns that have put the machine in their foundries.

OBITUARY.

W. Dewees Wood.

W. Dewees Wood, the well known sheet iron manufacturer, president of the W. Dewees Wood Co. of McKeesport, Pa., died at Pittsburg, Monday evening, Jan. 2, aged 73 years. Though his last illness was but 10 days, he had lived retired from business since 1889, in part because of his health. Mr. Wood was born in Philadelphia, the son of Alan Wood, a sheet iron manufacturer, whose father, James Wood, had founded the Schuylkill Iron Works at Conshohocken, Pa., early in the century. The successor to this plant is now operated by the Alan Wood Co., in which are Alan Wood, Jr., and Howard Wood, brothers of W. Dewees Wood. Receiving only a common school education, W. Dewees Wood went to Wilmington, Del., as a young man to manage one of his father's sheet iron mills. The McKeesport Iron Works, the original plant at McKeesport, Pa., was established in 1851, by Mr. Wood and Richard B. Gilpin, his father-in-law. In 1855 Max. Moorhead and Geo. F. McCleane entered the firm, but retired in 1882. The McKeesport works manufactured from the start a patent planished sheet iron by a process patented by Mr. Wood. Later, smooth, refined and galvanized sheets were added. In 1882 Mr. Wood and Alan W. Lukens, his cousin, formed the firm of Wood & Lukens, and manufactured American-Russia and black sheets. In 1871, on Mr. Lukens' retirement, the firm of W. D. Wood & Co., Ltd., was formed, taking in three sons of the founder. In 1888 the firm was incorporated under the name of the W. Dewees Wood Co., Mr. Wood being president; Richard G. Wood, vice-president and general manager; Alan W. Wood, secretary and treasurer, and Thomas D. and George W. Wood, stockholders without official position. The small works built in 1851 has become one of the largest in the Monongahela valley. Its annual capacity is between 12,000 and 15,000 tons of patent planished sheet iron which has done much to displace in this country the Russian irons. Over $1,000,000 is invested and 1,000 men are employed. Mr. Wood also owned the Wellsville Plate & Sheet Iron Co., of Wellsville, O., and was interested in bank, glass and gas enterprises, selling out the McKeesport illuminating gas works two years ago to the United Gas & Coke Co.

John W. Chalfant.

For 40 years a prominent figure in iron and steel manufacture in the Pittsburg district, John W. Chalfant died at his home in Allegheny, Wednesday, Dec. 28, aged 71 years. He was one of Pittsburg's representative men, active in politics, philanthropy, in club and college life, as well as in industrial and commercial affairs. He was born near Turtle Creek. At 19 he entered Jefferson College, afterward Washington and Jefferson, graduating in 1850 as a classmate of U. S. Senator M. S. Quay. He then started as a clerk with Zug & Lindsay, iron manufacturers, the firm later becoming Zug & Painter, occupying the present site of J. Painter & Sons Co. In 1854 Mr. Chalfant entered the employ of Spang & Co., who operated the Etna Iron Works, on Pine Creek, near Sharpsburg. He remained as a clerk with this firm until its dissolution in 1858, by the retirement of James McAuley.

The firm of Spang, Chalfant & Co. was then formed, consisting of Charles F. Spang, Charles H. Spang, John W. Chalfant, Alexander M. Byers and Campbell B. Herron. The firm remained with these members until January, 1864, when it expired by limitation, Mr. Byers retiring to form A. M. Byers & Co. The firm has since been conducted by Charles H. Spang, Mr. Chalfant and the heirs of Mr. Herron. The firm operated large pipe mills at Etna and has long been one of the foremost in the Pittsburg district.

In 1871 the Isabella Furnace Co. was formed by Mr. Chalfant and the members of J. Painter & Sons Co., and Mr. Chalfant became its president, holding the office until his death.

The company's blast furnaces are operated at Pine Creek. In 1878 the Spang Steel & Iron Co. was formed as a branch of the larger firm, and Mr. Chalfant became one of its directors and largest stockholders. In connection with these mills Mr. Chalfant was the first manufacturer in Pittsburg to introduce natural gas as a fuel. He organized the Natural Gas Co., Ltd., in 1875, with Graff, Bennett & Co., to pipe the gas from a point in Butler Co., near Bakerstown. He was also a director in the Pioneer Gas Co., which succeeded the Natural Gas Co. In the effort for competitive freight rates he became interested in the Pittsburg & Western Railroad and was a director in the company. He was a director, also, in the Pittsburg Junction Railroad, and in the Pittsburg Locomotive Works, as also in several banking and trust companies. About a year ago, owing to ill health, Mr. Chalfant retired from active business life. He is survived by his wife and by five children, including Henry Chalfant, of Spang, Chalfant & Co. Of his three brothers, Geo. A. Chalfant is connected with Spang, Chalfant & Co., and is superintendent and manager of the Etna Iron & Tube Works.

J. D. Clare.

James David Clare, of Portsmouth, O., for a number of years identified with the iron industry of the Hanging Rock district, died in a hospital at Columbus, O., Dec. 21. He was born in 1822 and in 1836 went to Lawrence Co., O., where his father was employed in connection with Lagrange and Vesuvius furnaces. In 1866 he was one of the purchasers of Madison Furnace, in Jackson Co., the operators being Clare, Dudoit & Co. He was president of the Clare Iron Co., operating Bloom Furnace at Bloom Switch, Scioto Co., O., and president of the Ohio Stove Co., Portsmouth, which he helped to establish in 1872.

CUP AND CONE GRINDING MACHINES.

An interesting example of the extensive lines of machinery that have been developed to meet the requirements of bicycle manufacture is found in the machines devised by the Pratt & Whitney Co., of Hartford, Conn., for grinding the ball race of bicycle cups and cones and for the outside of cups. The general description, as furnished by the manufacturers, notes these features:

"Various styles are made for straight and angular grinding, or for automatically grinding to a predetermined curve, the operation being performed either before or after the cups and cones are placed in the hub or on the axle. On combinations Nos. 1, 2 and 3 the construction of the bed, head and countershaft is the same. The spindle of the head is of tool steel, hardened and ground, having a straight long bearing in a cast iron bushing, with an adjustment for taking up wear. The collet, or chuck, for inside work is a step chuck split in three places and is closed by means of springs in an ordinary spring barrel. For outside work an expansion chuck is used. At one end of the head stock is pivoted a lever which extends under the bed and is there connected by a wire cord to a wooden treadle secured to the floor by hinge and screws; a pressure on the treadle by the foot causes the drawback chuck to open for inserting or taking out the cups, the lever also acting as a brake for stopping the head spindle immediately. Removing the pressure from the treadle permits the chuck to close, clamping the cup to be ground. Two special countershafts are designed for driving these machines, one for attaching to the ceiling, the other to the wall. [The former is illustrated.] The belt is shifted by means of a connection with the same treadle that operates the opening and closing chuck mechanism in the head."

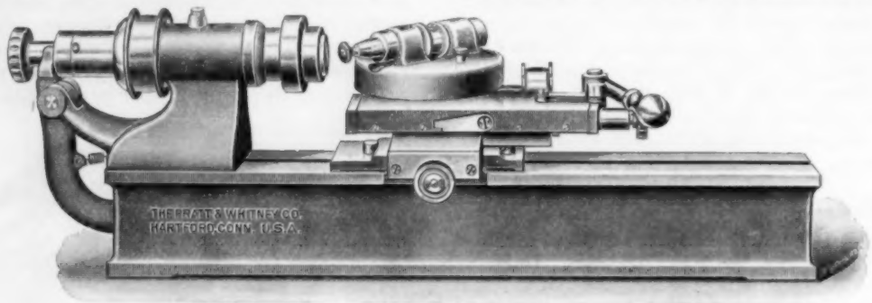


FIG. 1.—COMBINATION NO. 1.

Combination No. 1, in addition to the bed, head stock and countershaft, is fitted with inside form grinding attachment for grinding automatically the inside of cups to any of the ordinary forms. The grinding attachment consists of upper and lower slide, the lower one being attached to the bed by means of two special clamps, the lower, or cross slide, also having an adjusting screw by which the diameter to be ground can be determined. The hand lever on the upper slide is used to move the emery wheel to and from the work.

The emery wheel travels in a predetermined path and is controlled by a cam, or form, located under the wheel head. This form can be made for grinding at right angles almost to a sharp corner, or a curve and the two surfaces tangent to it of any radius up to one-half inch. The spindle of this attachment has a special form of bearing, consisting of separated balls running in suitably ground tracks, a speed of 30,000 revolutions per minute having been maintained with this style of bearing for weeks, it is said, without heating or perceptible wear.

Combination No. 2 consists of bed, head stock and countershaft, and is fitted also with outside grinding attachment for grinding outside, straight or angular surfaces of cups or cones, but will not grind curves. The attachment is secured to the bed by means of suitable clamps, and has an adjusting screw by which the diameter to be ground can be determined. The hardened and ground tool steel spindle three-quarter inch in diameter runs in suitable hardened bearings, carries an eight-inch emery wheel and is operated by hand.

Combination No. 3 consists of bed, head stock and countershaft, as described on preceding pages, and is fitted also with inside form grinding attachment as described for combination No. 1, and outside grinding attachment as described for combination No. 2, being suitable for performing the same work as the No. 1 and No. 2 combinations but not simultaneously.

Combination No. 4 consists of the bed, two inside form grinding attachments as described for combination No. 1, one right hand and one left hand, and countershaft, also special head, being suitable for grinding cups automatically after their insertion in the hub, both cups being ground at the same time. The special head, placed in the center of the bed, has a quick action chuck operated by a foot treadle, making the operation of inserting or removing hubs very simple.

Combination No. 5 consists of bed, inside form grinding attachment and countershaft, as described for combination No. 1 and a special head having an overhanging arm for grinding cones automatically after they are placed upon the axle, the axle being supported on dead centers and driven by a pulley revolving on the front end of the fixed head spindle.

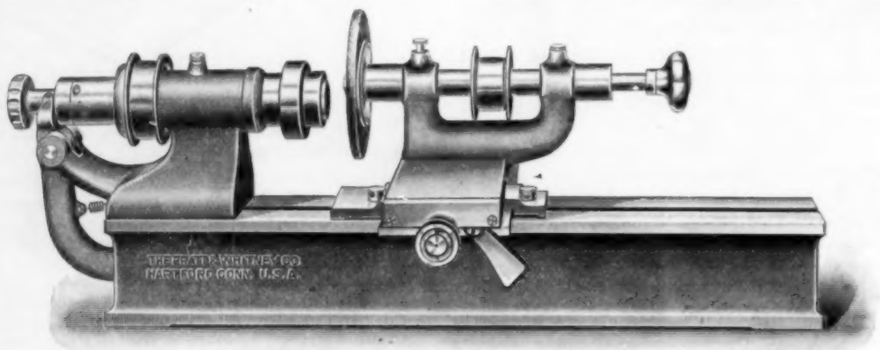


FIG. 2.—COMBINATION NO. 2.

Some of the work done on combinations Nos. 1, 4 and 5 is shown in the cuts on page 18.

THE Keystone Furnaces of the Reading Iron Co., rebuilt during the last year, will be put into operation this month. The furnaces will have a very largely increased production, the improvements made enabling the company to turn out 1,700 tons of iron weekly, as compared with 450 under the old regime. The plant will probably be run on foundry iron for the first five or six months, when mill iron will be taken up.

CAR AND LOCOMOTIVE BUILDING.

The *Railroad Gazette*, in its annual review of work in contract car and locomotive plants in 1898, has the following:

During the past year all the contracting locomotive shops in the United States (that is, those outside of the railroad shops) built 1,875 locomotives, against 1,251 in 1897, an increase of 624, or nearly 50 per cent. In fact, the increase comes within 71 of representing the total output in 1894, and is greater by 218 than the increase of 1895 over 1894, which increase was the largest since 1887. Of the 1,875 locomotives built in 1898, 373, or 20 per cent, were compounds, which is 230 more than in 1897, when the output of compound locomotives represented but 11 per cent of the total output. The total also includes 12 electric and three compressed air locomotives. The building of locomotives for export continues to steadily grow; but while the number is greater by 168 than last year, the percentage of the entire output decreased one per cent. In 1896, 309 were sent abroad; in 1897, 386, and in 1898, 554; that is, in 1898, 30 per cent of the total was ordered for export; in 1897, 31 per cent, and in 1896, 26 per cent. In our issue of Jan. 6, 1888, we published statistics giving the yearly output of locomotive builders from 1880 to 1887, inclusive. The following table shows the number built each year since that time:

1898	1,875	1892	2,012
1897	1,251	1891	2,165
1896	1,175	1890	3,240
1895	1,101	1889	1,860
1894	695	1888	2,180
1893	2,011		

The year just closed has been a notable one for the locomotive building industry in two respects: In the size of engines built and the size of single orders. In size of engines, we refer particularly to the 115-ton engines built by the Pittsburg Locomotive & Car Works, for the Union Railroad, and the one weighing 113 tons, built for the Lehigh Valley by the Baldwin Locomotive Works. Among the large individual orders were the following: Great Northern, 30; Missouri Pacific, 25; Illinois Central, 25: Atchison, Topeka & Santa Fe, and Santa Fe Pacific, 50; Baltimore & Ohio, 50; New York Central & Hudson River, 30; Lake Shore & Michigan Southern, 45; Southern Pacific, 51, and Philadelphia & Reading, 30. The five last orders were placed during December, and will serve to keep several builders busy for at least a part of January. Of course, a number of roads ordered engines in two or more lots, the totals of which aggregated over 25, and nearly all the roads we have named bought more than the numbers here stated, but at different times.

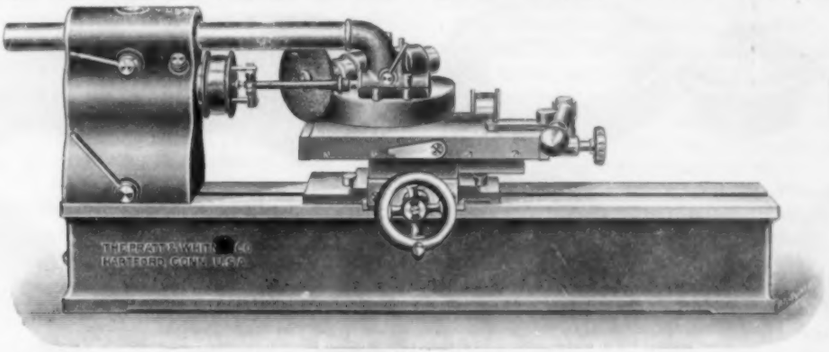


FIG. 3.—COMBINATION NO. 5.

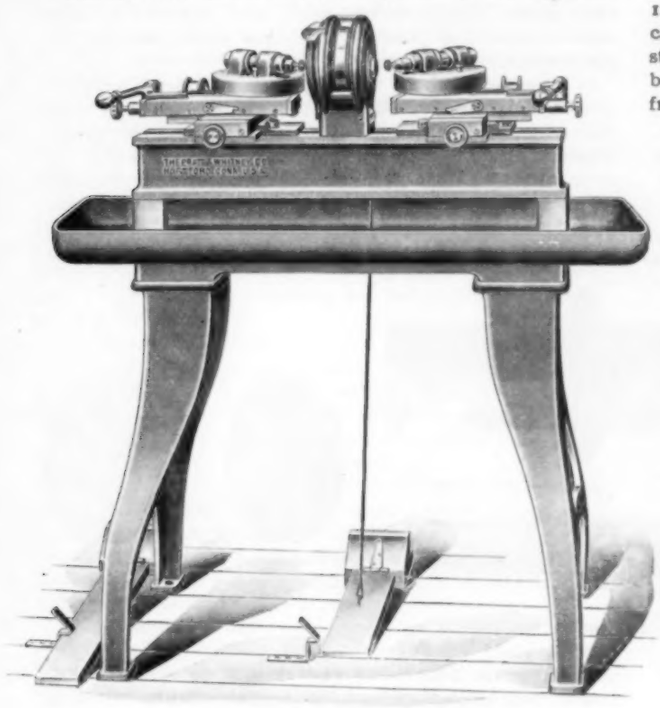


FIG. 4.—COMBINATION NO. 4.

In the year just closing the contracting car building companies did the greatest business that they have done since 1890. The total number of freight cars built during this last calender year was 99,809, the passenger cars were 699 and the street railroad cars 4,650, or a total of 105,158. In 1890, the best year so far as our records show, the output was 103,000 freight cars, but in 1891 and 1892 nearly 100,000 were built each year. The increase of 1898 over 1897 is quite wonderful. In that year our reports from 30 contracting companies (and five estimated) showed 43,588 freight cars. This year our reports are from 28 companies and from 26 others we have made estimates carefully checked. These are mostly very small concerns. In 1896 the freight cars built outside of the railroad shops amounted to 51,189, in 1895 to 38,100 and in 1894 they aggregated only about 18,000. Among the cars reported this year we find 1,723 built for export; of these, 97 were street cars. In making this summing up of car build-

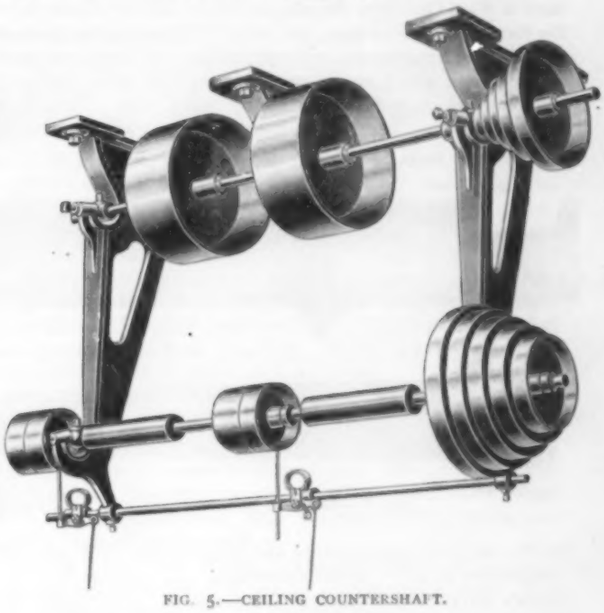


FIG. 5.—CEILING COUNTERSHAFT.

ing last year we found 2,107 street railroad cars reported to have been built. We said at this time that this was certainly much below the number actually built, as our reports were from few concerns outside of those which built steam railroad cars as the most important part of their work. This year we have been able to get more reports from the companies devoting themselves especially to street car work and find a total of 4,650. These figures for the two years should not be compared. In writing a year ago we said: "We judge from the estimate of probable equipment requirements printed elsewhere that the year 1898 will be a much better one for the car builders than the year just passed." This prediction has been carried out far beyond our expectations.

FIG. 6.—SAMPLES OF WORK GROUND ON COMBINATION NO 1.

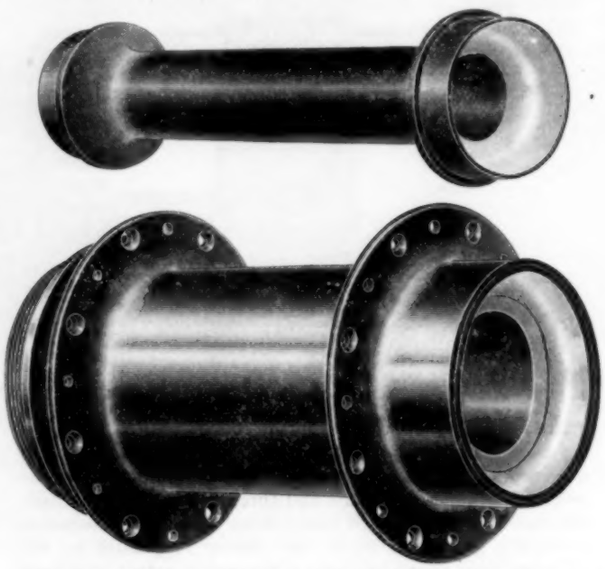


FIG. 7.—SAMPLES OF WORK GROUND ON COMBINATION NO 4

PRESIDENT GARY, of the Federal Steel Co., says that there is no foundation for any statements intimating that antagonism exists between the Illinois Steel Co. and the American Steel & Wire Co., since the resignation of John W. Gates from the former some time ago. He adds: "There is the greatest good feeling between the two companies. At Joliet, we have a rolling mill which makes steel rods, and the wire company has a mill which uses steel rods to make wire. They buy their rods of us. They also purchase a large quantity of steel billets, which we manufacture and they do not. We are not competitors at all." Asked concerning the reasons for Mr. Gates's resignation, President Gary said: "Principally because he was about tired out. He also has large interests in the American Steel & Wire Co. and is going back to them. The wire people were sorry to have him leave when he went over to the Illinois Steel Co., and they are glad to get him back. Mr. Buffington was the only candidate to succeed him who has ever been considered by our people."

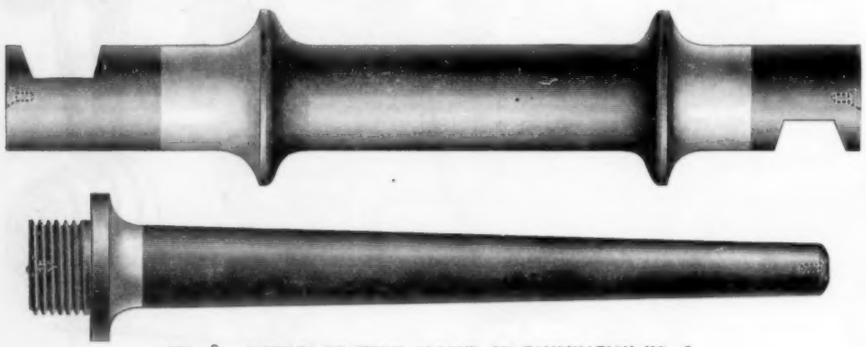
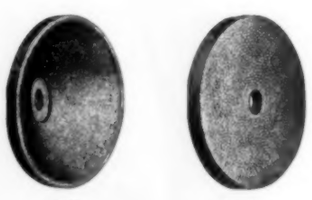


FIG. 8.—SAMPLES OF WORK GROUND ON COMBINATION NO. 5.



CUP. FLAT.

FIG. 9.—EMERY WHEELS FOR GRINDING MACHINES.

CHICAGO papers note that the Fisher Electric Motor Co., of that city, has just closed a contract to deliver to a Parisian company, in the next 10 years, 5,000 auto mobile carriages.

RECEIVED FROM THE TRADE.

In Catalogue P, just from the press, the Hilles & Jones Co., of Wilmington, Del., do not attempt to present a general list, but rather a few representative machines in their various lines. These include special machinery for working plates, bars and structural shapes, punches and shears, bending and straightening rolls, plate planers, vertical milling machines, riveters and beam copers. The pamphlet is 9x12 inches and contains 32 pages. The illustrations are full-page, for the most part, and consist of clear half-tones which show excellently the massive construction and the method of applying and using power. An illuminated cover, with half-tone illustrations of shears and punches, for corner pieces, adds to the attractiveness of the work.

In its pocket pamphlet "A Talk on Cores," the Millett Core Oven Co., of Brightwood, Mass., presents tersely, and with illustrations, the advantages of the Millett patent core ovens. A prime feature in this oven is that the shelves on which the cores are placed are made in the shape of a quadrant, bounded on one radius by the door and on the other by a rear door. Thus as the door swings open and the shelf which is attached to it swings out, the rear door closes the space which had been occupied by the front door. Thus there is no smoke and no loss of heat, which the oven must regain. Hurry in taking out cores is avoided and the loss by breakage is lessened. A portable oven of the same type is built for smaller cores. The pamphlet contains, in addition to the description, expressions from users of the Millett oven in many prominent foundries of the country, in addition to a letter from Sulzer Bros., proprietors of the great foundry at Winterthur, Switzerland.

Chas. H. Hawkins, Western Union Bldg., Chicago, agent of the Brown-Bonnell Iron Co., Youngstown, O., has sent out his annual reminder in the shape of a desk pad daily calendar. Mr. Hawkins has been remembering the trade in this way for several years.

The elaborate Treatise on Mechanical Draft recently issued by the B. F. Sturtevant Co., of Boston, Mass., is unique as a trade publication, in that it presents no claims on its own account for the merit of the system or the apparatus necessary, but gives simply the statements of unbiased witnesses. The following from among these quotations is of special interest, as it summarizes the advantages of mechanical draft as presented by the well-known engineer Mr. Alfred Blechyden, in a paper before the British Institution of Mechanical Engineers. He says: "First, it seems fairly well established that, if the boilers are well constructed and are provided with ample room to insure circulation, their steaming power may without injury be incresed to about 30 to 40 per cent over that obtained on natural draft for continuous working, and may be about doubled for short runs. Secondly, such augmentation is accompanied, in normal cases, by an increased consumption per indicated horse-power. But, thirdly, the same or even greater power being indicated it may, with moderate assistance of forced draft, be developed with a smaller expenditure of fuel, the grates, etc., being properly proportioned. Fourthly, forced draft enables an inferior flue to be used; and, fifthly, under certain conditions of weather, when with normal proportions of boiler it would be impossible to maintain steam with natural draft, the normal power may with forced draft been sured In particular cases any or all these advantages may be a source of economy; and the first of them may render possible that which would otherwise be impracticable."

A red morocco blotter holder, with ornamental metal corners, and the names of its brands of iron stamped in gilt—"Pioneer," "Antrim," and "Elk Rapids"—comes with the compliments of the Superior Charcoal Iron Co., Grand Rapids, Mich.

The 1899 calendar of the Washington Coal & Coke Co., general office at Dawson, Pa., and sales office at Pittsburg, has for its art subject the mill erected by Geo. Washington in 1775 on Washington Run, adjoining the property of the Washington Coal & Coke Co. The engraving is highly artistic.

Stevenson, Field & Co., Columbus and St. Louis, remember their patrons with a leather holder filled with monthly alendar cards for 1899.

From the Lincoln Foundry Co., Pittsburg, comes a unique paper weight—a nickeled roll in its bearings, with a pack of sheets for a base, and a bronze medal, bearing a bust of Abraham Lincoln in relief, resting against the roll.

The Cleveland Facing Mill Co., Cleveland, sends to the trade a "ready reminder" of daily engagements for 1899, which has a feature unknown a year ago—a summary of the war revenue law of 1898 and of documentary stamp taxes in effect July 1, 1898. A list of foundry supplies handled by the company is given on fly leaf pages.

Otis, Hough & Co., Cuyahoga Bldg., Cleveland, sales agents for Jones & Laughlins, Ltd., and for a number of companies manufacturing in special iron and steel lines, present their compliments to their customers accompanying a leather bound pocket memorandum book which gives valuable general information in addition to some trade details.

Calendars for 1899, bearing artistically colored figure pieces that belong to a high grade of embossing work, are issued in four styles by the Bridgeport Crucible Co., of Bridgeport, Conn. The company's specialties, furnace and stove clay, stove lining, etc., are mentioned also. A copy of the calendars will be sent on application.

CONSIDERABLE mystery has surrounded the plans of the Titan Steel Co., Chicago, in which European capital, represented by Carl and Adolph Mannesman is reported to be interested. It is known that a Government contract was given the Mannesman syndicate, but lately news of the progress of the project has been lacking. Chicago dispatches now say: "It is asserted here that two new steel plants, one at South Chicago for the manufacture of steel shells and projectiles by a new process, and the other at Kensington for the production of patent hollow steel car axles, will shortly be built by a syndicate of Europeans, represented by Carl and Adolph Mannesman, in conjunction with the Federal Steel Co., at South Chicago and the Pullman Co., at Kensington. It is announced also that $3,000,000 worth of projectiles for the Federal Government will be manufactured by the Mannesmans and the Federal Steel Co. jointly.

INDUSTRIAL SUMMARY.

New Buyers in the Market, and Some of Their Wants:—

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

The Ohio Fire Brick Co., Oak Hill, O., which took out incorporation papers Aug. 1, 1898, has now completed one of the most modern fire brick works in the Southern Ohio district. This company will manufacture fire brick of different grades, shapes and sizes.

The Consolidated Pump Co., Toledo, O., recently organized to manufacture wood suction and chain pumps, tubing, chain and window and door screens, will occupy the building formerly owned by the Toledo Pump Co. The main building is of brick and two stories, 50x135 feet. The company will purchase, in addition to equipment now on hand, door clamps, mitering machine and folder.

For its new plant the Lobdell Car Wheel Co., Wilmington, Del., will require a 30-ton electric traveling crane.

The establishment of machine shops at Jonesboro, Ark., by the Paragould Southeastern Railway Co., is under consideration. Blacksmith shop equipment has been bought recently.

At Meridian, Miss., the Martin Machine Works have been organized, capital $15,000, to operate machine works. The incorporators are: E. J. Martin, R. C. Smith, C. P. Weatherbee, C. C. Kamper, G. M. Hodges, C. M. Rubush and others.

The Chartiers Iron & Steel Co., of Carnegie, Pa., has been incorporated to manufacture specialties. J. Henry is the president.

The incorporation of the South American General Electric Supply Co., of New York, which is composed of department managers of the General Electric Co., is to do away with foreign agencies of the latter and be represented in the foreign field direct. The new company will sell electrical supplies manufactured by the General Electric Co., to the Argentine Republic, Uruguay, Paraguay, Chili and Bolivia, in connection with friendly companies already established in these countries.

A number of Lynchburg, Va., citizens have bought the Norwich Lock Works, at Roanoke, Va., and may remove the plant to Lynchburg.

New Construction:—

The United Gas Improvement Co., of Gloversville, N. Y. is erecting a new plant, consisting of generator house and boiler and engine house. The building is about 50 feet wide and 80 feet long. It will be fire-proof throughout. The side walls are of brick, and the roof framing of steel, which will support slate roof covering. The trusses are clear span—no interior columns—and rest directly on the side walls of brick. The steel work was furnished and erected in place by the Berlin Iron Bridge Co., of East Berlin, Conn.

In addition to the extensive improvements in their blast furnaces, ore yards, etc., and the building of a fourth furnace, Jones & Laughlins, Ltd., will erect two mills, of which detailed plans have not yet been prepared. An expenditure of about half a million will be made for these mills.

Additional land has been bought by the Crane Co., of Chicago, at $65 000, and new buildings and equipment will be erected at a large outlay. A foundry, 226x93 feet, will be erected at once and other buildings later. The present foundry is 100x205 feet and five stories. Gas, water and steam goods are manufactured. The present foundry turns out about 70 tons of castings a day.

The Twin City Iron Works, Minneapolis, have begun work on a new machine shop. It will be 92x109, two stories. It is next to the present shops, and will cost $2,800.

A large extension is to be built to the works of the Westinghouse Machine Co., at East Pittsburg, Pa., and a meeting of stockholders will be held March 1 to vote to increase the capital stock from $1,500,000 to nearly double. Work will be started on the foundation of the addition within a month. The main shop is now 600 feet long and 250 feet wide.

It is reported that a new plate mill, modeled after the 119-inch mill is to be built at Homestead, in view of the establishment of steel car works there by the Carnegie Steel Co., Ltd.

The E. W. Ross Co., Springfield, O., will enlarge its foundry to about double the present capacity.

For every ten (10) degrees added to the temperature of the feed-water, about one per cent of the total cost for fuel will be saved.

210°
160°
50°—5 per cent saving.

Many feed-water heaters give a lower temperature than 160°, because their heating surfaces are coated with scale and oil, or because insufficient heating surface is provided.

210 degrees is easily obtainable with a Cochrane Heater every day—every year. You can always get the temperature, due to the steam, with a "Cochrane," so long as you can get the steam and water into them. We furnish a thermometer with each one, just to show you what they are doing; and then these heaters really purify the water, no matter how bad it is, or what kind of scale is in it. Wonderfully easy to clean. Reliable in operation. Made of the best materials—best suited to withstand corrosion or the action of the acids found in feed-waters.

HARRISON
SAFETY BOILER WORKS,
Heater Department,
Philadelphia, Pa.

The Caird & Hawksworth foundry at Helena, Mont., which was partly burned last week, with several thousand dollars loss, will be rebuilt.

The Cole Mfg. Co., Chicago, manufacturer of stoves, will erect a new building 350x50 feet; later a foundry building will be put up.

M. R. Williams and associates propose to erect a tin plate plant at Terre Haute, Ind., and a bonus of $25,000 is expected from citizens. Crawford Fairbanks is the local promoter of the enterprise. A $200,000 company is proposed.

Land has been purchased for an addition to the plant of the Hartman Mfg. Co., at Ellwood City, Pa. The business has been acquired recently by A. T. Brooke, for several years Eastern agent of the Hartman company, the consideration being close to $100,000. The product is wire fencing, mats, tree guards and other specialties.

At Baltimore, a permit has been granted the Norton Tin Plate & Can Co. to erect a two-story building to cost $3,500.

Joesting & Schilling, furnace and range manufacturers of St. Paul, have leased land adjoining the Waterous Engine Works, and will erect a new building to cost $7,000.

The report is again circulated that additional furnaces are to be erected by the Illinois Steel Co., on its Cheltenham beach property.

The following additional contracts have been let by the Alabama Steel & Wire Co., Birmingham, Ala.: All gravel roofing, to O. A. Smith & Co., Atlanta, Ga.; corrugated iron roofing, to Cincinnati Corrugating Co., Piqua, O.; all brick and stone mason work to the Minor Engineering & Construction Co., Birmingham, Ala. Bids have been put in for a considerable part of the machinery and awards will soon be made.

Work is progressing rapidly on the addition to the radiator plant of the Titusville Iron Co. The company is constructing a sand conveyor and truck haul, which are expected to facilitate foundry operations greatly.

The Belle City Malleable Iron Co., Racine, Wis., expected to commence molding in one of the departments of its new foundry building this week. The new buildings, replacing those recently destroyed by fire, add much to the old capacity, as already detailed in these columns.

The Shoenberger Steel Co., of Pittsburg, has let a contract to the A. Garrison Foundry Co. for a continuous wire plant. The Riter-Conley Mfg. Co. has the contract for the buildings. The construction of the continuous mill will be after plans of the Garrett-Cromwell Engineering Co., of Cleveland. The capacity will be 400 tons in 24 hours. It is expected the plant will be ready for operation in June.

It is reported that the LaBelle Iron Works, Wheeling, W. Va., will erect two new plate mills for the manufacture of merchantable plate and skelp.

Benj. Nichols & Son, Jamestown, N. Y., are enlarging their machine shop by an addition 16x75 feet, and intend soon to increase the foundry capacity.

Fires and Accidents:—

A bursting fly wheel in the bar mill of the Shenango Valley Steel Co., at New Castle, on Dec. 30, seriously injured Supt. John Stevenson, Jr. The spokes and rim of the wheel were broken to fragments. One piece weighing about a ton was hurled 150 feet.

Fire in the radiator department of the M. Steel Co.'s works, at Springfield, O., caused a loss of $3,000.

The foundry of the Ontario Wind Engine & Pump Co., Toronto, Ont., was damaged to the extent of $2,000 by fire.

North Cornwall Furnace, at Lebanon, Pa., operated under lease by the Lackawanna Iron & Steel Co., was badly damaged by an explosion Dec. 25.

On Dec. 28 fire destroyed the machinery house, coal bins and boiler house of the Semet-Solvay by-product plant of Ensley City, Ala. The machinery is damaged considerably and there will be many weeks of repair work.

General Industrial Notes:—

The Carnegie Steel Co. recently shipped 300 tons of armor plate for the Russian government's battleship Aslabi.

At the works of the United States Iron & Tin Plate Mfg. Co., Demmler, Pa., seven mills resumed operations Jan. 2. The mills have been rebuilt. Four additional mills will be ready for operation 30 days later.

The additions to the Morton tin plate plant, at Cambridge,

The Q & C
Shop Saws
Cut Everything. - - - -

No. 1. Capacity, 4 inches.
No. 2. " 5 "
No. 4. " 8 "
No. 8. " 3x12 "

POWER SAWING MACHINES
For all purposes.

THE Q AND C

Chicago. New York.
Send for Catalogue.

MOUNT SAVAGE FIRE BRICK.

UNION MINING CO,

Proprietors of the CELEBRATED Mount Savage Fire Brick

GOVERNMENT ⁂ STANDARD.

Established 1841. Capacity, 60,000 Per Day; 18,000,000 Per Year.

The First Manufactory of its Kind in the U. S.

Home Office and Works:—MOUNT SAVAGE, Alleganv County, Md.

Branch Offices:—No. 1 Broadway, New York, N. Y.; No. 222 So. Third St., Philadelphia, Pa.; Fergusen Block, Pittsburgh Pa., Stowe, Fuller & Co., 249 Arcade, Cleveland, Ohio.

OTIS STEEL

"OTIS" FIRE-BOX PLATES A SPECIALTY.

Flange Plates, Ship Plates, Tank Plates, Steel Car Axles and Forgings of all kinds.

Steel Castings from 100 to 75,000 lbs.

Head Office and Works, CLEVELAND, OHIO.

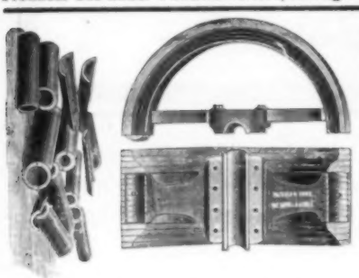
Agencies: NEW YORK, 97 Cedar St. CHICAGO, Old Colony Bldg.
ST. LOUIS, 516 N. Third St. WASHINGTON, Kellogg Bldg.
MONTREAL, Homer Taylor, 183 St. James St.
SAN FRANCISCO, John Woodlock, 154-156 First St.

Conestoga Building, EDWARD E. ERIKSON, PITTSBURG, PA.

Regenerative Gas Furnaces and Water Seal Gas Producers.

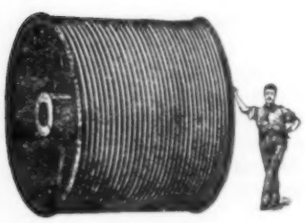
Producer Gas under Tubular Boilers, saving 20 per cent in fuel. NO SMOKE.

The A B C of Iron, Now $1.



INDEPENDENCE WOOD SPLIT PULLEYS.

GRAIN ELEVATOR MACHINERY, MILL SUPPLIES.

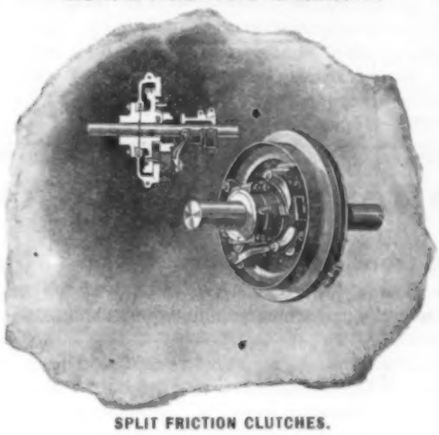


ROPE WHEELS.

RICE MACHINERY Co.,

ENGINEERS, FOUNDERS and MACHINISTS.

AMERICAN SYSTEM ROPE TRANSMISSION.



SPLIT FRICTION CLUTCHES.

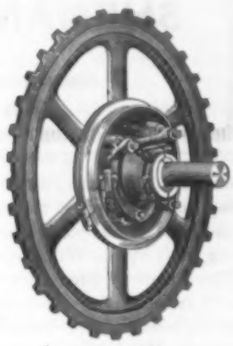
COMPLETE ESTIMATES FURNISHED.

166-174 So. Clinton St., CHICAGO.

TELEPHONE 4448 MAIN.

IRON CENTER, WOOD RIM DYNAMO PULLEYS.

BREWERY MACHINERY.



SPROCKETS.

O,. are completed and the plant now contains six hot mills and six cold mills. The main mill building is 500x135 feet There are three mill engines, the first installed being 1,025 h. p., with 57-ton fly-wheel. The old plant has been operated continuously during the past year, without accident to cause any delay. We have it on authority that not a single roll has been broken at the plant in the past 17 months, which is certainly a remarkable record.

The National Tube Works, McKeesport, Pa., have been undergoing repairs. The concern has orders booked to run the works for three or four months.

Dorman & Co., of Cleveland, who have manufactured for a number of years the Triumph furnace, are going extensively into copper and brass work and into black and galvanized iron tank building, using material from No. 14 gauge and thinner. They have been manufacturing tanks for the National Acetylene Gas Co., and have been quite busy on miscellaneous work, employing 25 men. It is the intention later to put in stamping machines and still further increase the scale of operations.

A new trial was refused at Pittsburg in the case of F. F. Vandervoort & Co., Ltd., a verdict having been given the plaintiff on a contract.

Extensive improvements in furnaces have been made at the plant of the Oliver Iron & Steel Co., South Side, Pittsburg.

The new pumping engine for the Jones & Laughlins fur-

U. BAIRD MACHINERY CO.,

3-125 Water St., **PITTSBURG, PA.,** 124-126 First Ave.

Machine Tools and Supplies. Send for list of Second-hand Tools.

P & B

PAINT

The best preservative for IRON AND WOOD work exposed to moisture or the actions of acids, alkalies, coal-gas, etc. Contains no oil or tar. Is durable, penetrating and elastic. Of special value for coating roofs, stacks, tanks, vats, etc.....

Write for prices and further particulars.

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BRASS

Founders and Finishers.

PLATING

CHAS. L. BASTIAN MFG. CO.,

Franklin and Illinois Sts.
Chicago.

KENTUCKY FIRE BRICK WORKS,

CUPOLA BRICK. STEEL WORKS BRICK.

KENTUCKY FIRE BRICK WORKS, PORTSMOUTH, O. HIGH GRADE FIRE BRICK BEST BLAST FURNACE & ROLLING MILL BRICK

FIREBRICK, KY.

PUNCHES AND SHEARS

OF ALL KINDS

MANUFACTURED BY

The Long & Allstatter Co.,

HAMILTON, OHIO.

Send for catalogue.

McDOWELL

SEMI-STEEL

PROCESS.

(Cupola metal.) Government tests 36,000 to 49,000 tens. strength.

HANSON McDOWELL,
1522 Monadnock, Chicago.

WANTED!

Chemist to work in foundry, located in Central Ohio. Steady position, with opportunity to advance. Reply, giving reference and salary. *XXX*, care The Iron Trade Review, Chicago.

Advertisements that are studdie, that are to the point and hat are frequently changed, bring best results.

SHENANGO VALLEY STEEL CO., New Castle, Pa.,

MANUFACTURERS OF

Bessemer Pig Iron, Steel Billets, Blooms, Black Plate, Tin Plate, Tin Plate Bars, Wire Rods, Market Wire and Wire Nails.

nace plant, Pittsburg, will have a capacity of 6,000,000 gallons a day, and the entire plant, with this addition, will have a capacity of 36,000,000 gallons. The new pumping outfit is being built by the Wilson-Snyder Co.

The Finished Steel Co., Youngstown, O., is now sending nearly one-half its output to foreign countries. In the past year shipments have been made to Great Britain, Sweden, Holland, Belgium and Australia. Frequent inquiries now come from the countries of Europe and from Japan and China.

The Chicago *Economist* says of the plans of the Titan Steel Co., of which there have been various reports recently in connection with projects in and about Chicago: "It does not appear that Carl and Adolph Mannesman, the Germans who are promoting this undertaking, have anything yet that can properly be called a contract with the United States Government for the manufacture of projectiles, but there is every prospect that they would be able to close a contract on highly favorable terms if their works were in operation. What they most want at the present time is money to build their works. Something like $100,000 has been promised, and another $100,000 is needed to make a start. The project seems to be meritorious, but there is nothing tangible to it yet, and may never be."

The Turner Engineering Co., of Bucyrus, O., announces that its Turner water tube boiler is meeting with ready acceptance by a number of important steam users. It is made in sizes from 100 h. p. to 500 h. p. and installations are now being made in various parts of the country ranging from the smallest to the largest. Among these contracts are two 100 h. p. boilers for the Standard Snuff Co., Nashville, Tenn.; two of 500 h. p. for the Midland Steel Co., of Muncie, Ind.; and three of 225 h. p., together with piping, boiler feeders and large stack for the Indianapolis Ice & Cold Storage Co., Indianapolis, Ind.

A Pittsburg dispatch of Dec. 29 says: One of the largest deals ever made for the sale of railway scrap iron has just been consummated by C. Jay Kane, of Pittsburg, and Harry Benjamin, of Cincinnati, of the Benjamin Iron & Steel Co., of Buffalo, the Block-Pollock Co., of Cincinnati and Chicago, and the Jackson-Woodin Mfg. Co., of Berwick, Pa. The deal includes 15,000 freight cars from the Central Railroad of New Jersey, and 29,000 tons of scrap metal, including 400,000 pounds of brass. The total value of the material sold is about $400,000. The Central Railroad of New Jersey, it is said, has ordered 4,000 new cars of heavier capacity and modern design.

The Forbes patent die stocks, manufactured by Curtis &

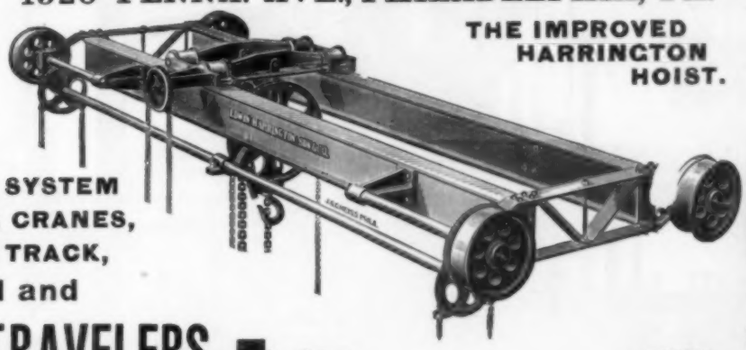
EDWIN HARRINGTON, SON & CO., Inc.,

DESIGNERS AND MANUFACTURERS OF

ENGINE LATHES, DRILLS, MILLING MACHINES, Etc.

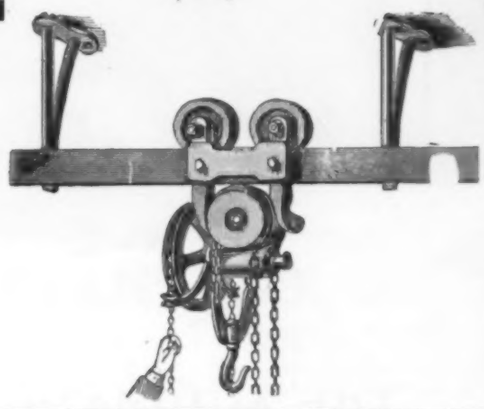
1526 PENNA. AVE., PHILADELPHIA, PA.

THE IMPROVED HARRINGTON HOIST.

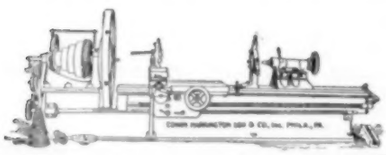


COMPLETE SYSTEM TRAVELING CRANES, OVERHEAD TRACK, Geared and

PLAIN TRAVELERS, TURN TABLES and SWITCHES.



OUR NEW ELECTRIC HOIST WORKS LIKE A CHARM.



MADE IN PHILA. ONLY.

Curtis, Bridgeport, Conn., have just been selected and two 8-inch machines ordered by the Government, to do the piping work contemplated in connection with the new water and sewer system which the Government will build at Havana, Cuba. Machines of the same pattern have been ordered by the Government for its work at the Dry Tortugas, off the coast of Florida.

Extensive additions are being made to the equipment of the Frankford Forge Co., at Ellwood City, Pa.

Elroy, Wis., is considering a proposition to make inducements for the Ontario Foundry Co. to remove its plant from Ontario to that city.

The Pennsylvania Co. expects to build more locomotives in 1899 than in 1898, when 75 were built. The company's shops turned out 7,000 new freight cars in 1898 and the supply is still short.

The record for fast engine building was broken last week in the Pennsylvania Railroad shops at Altoona, Pa. Work was commenced on a large mogul engine Dec. 27, and was finished at 1:30 P. M., Dec. 28, the time being 21 hours and 30 minutes. Photographs were taken every five hours. The frame of the engine was set up in 28 minutes.

The new rod mill at the Ashland (Ky.) Steel Co.'s plant will not be ready for two or three months, but the connected Kelly mill at Ironton, O., will be ready to draw wire in the latter part of January. It will buy rods in the market for the time being.

The Elkton Foundry, at Elkton, Md., has been purchased by W. T. Stackhouse, of Wilmington, Del.

Improvements are being made by the Ensign Mfg. Co., Huntington, W. Va., including new machinery.

Stockholders of the LaBelle Iron Works, Wheeling, are reported to have received checks for a 50 per cent dividend last week, in consequence of the sale of the tin plate plant of the company to the consolidated company.

Negotiations are reported to be still in progress for the acquisition of the Whitaker Iron Co.'s tin plate plant, at Wheeling, by the American Tin Plate Co.

The committee appointed by the stockholders of the Birmingham (Ala.) Rolling Mill Co., to report a plan of reorganization, has gone over the company's finances and expects soon to arrange a basis of operations. It is epected that the $200,000 hypothecated bonds of the company and the $75,000 of unplaced preferred stock will be used for this purpose.

The Colorado & Northwestern Road is purchasing a considerable quantity of rails and other track and rolling stock equipment in Pittsburg.

It is reported that the Morse Twist Drill & Machine Co., of New Bedford, Mass., has purchased the T. & B. Drill Co., of Danbury, Conn., and that the plant of the latter company is to be removed from Danbury to New Bedford.

Robert G. Wells, connected with the Nicopol-Maripol Mining & Metallurgical Co., of Maripol, Russia, has been in Pittsburg, to place orders for machinery aggregating $1,000,000 for plants at Maripol. As with other construction at the same place, the plans are those of Julian Kennedy, of Pittsburg.

It is reported that the present owners of the Valentine Iron Works, at Bellefonte, Pa., will take steps toward improving the furnace and giving an increased capacity, with a view to starting it up.

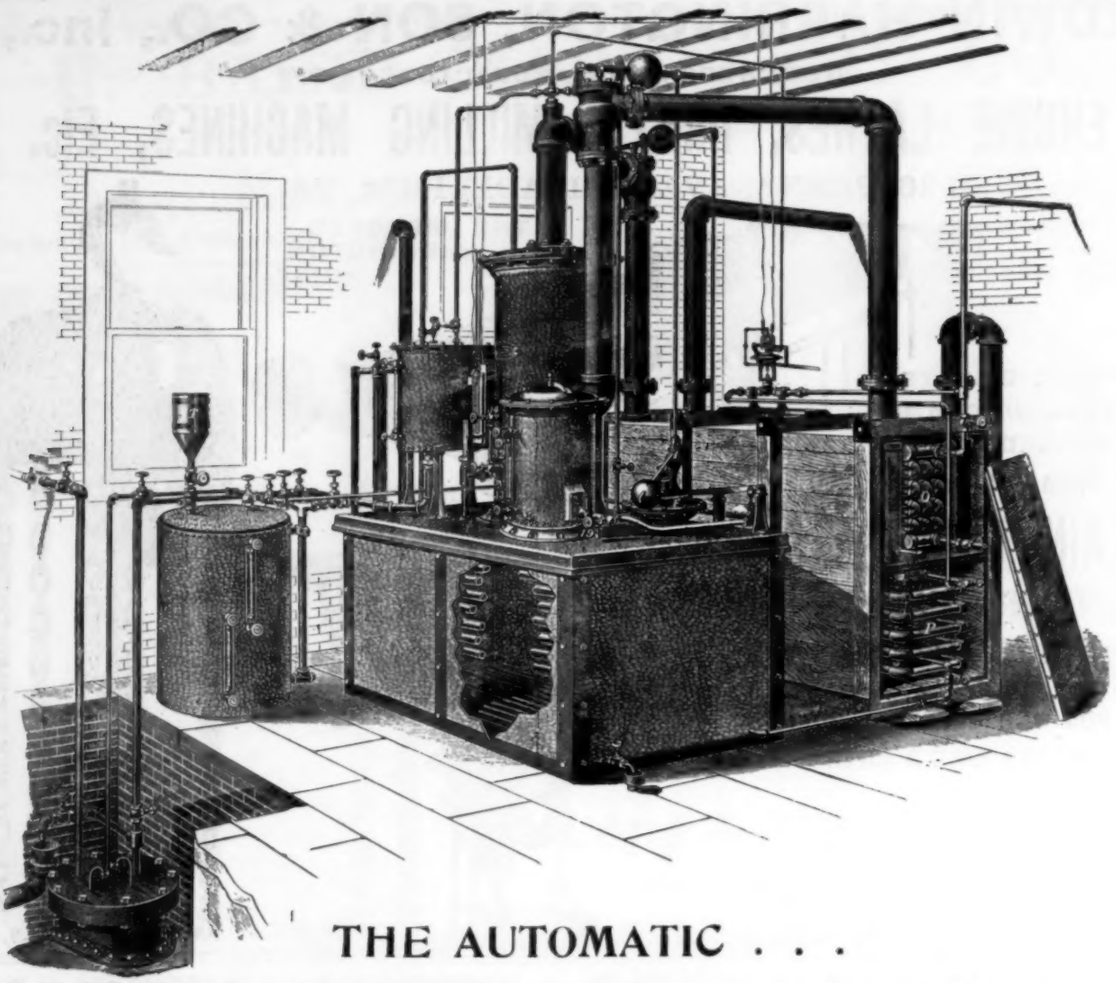
A contract for 18 steel plate tanks has been awarded to the Riter-Conley Mfg. Co., of Pittsburg, by the Gold Hill Mining Co., of Johannesburg, South Africa. The tanks will each have a diameter of 40 feet, and will vary in depth from nine to 24 feet. Altogether 600 tons of material will be used.

At Akron, O., Robert Munroe, of Pittsburg, has filed an action against the J. C. McNeil Boiler Co., for $10,000, which he alleges in due for royalties.

The Dillon-Griswold Wire Co., of Sterling, Ill., has increased its capital stock from $300,000 to $375,000.

A new 55-inch cupola at the Barnard & Leas foundry, Moline, Ill., and an addition to the building, just completed, doubles the capacity of the plant.

The steamship Lincluden cleared from Norfolk, Va., last week with 1,500 tons of steel billets, among other freight for England.



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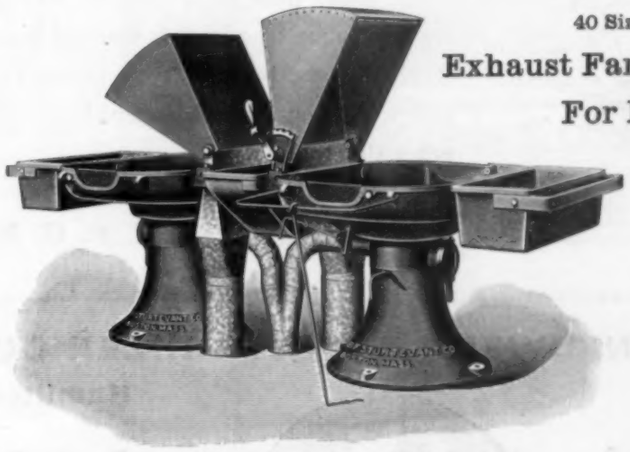

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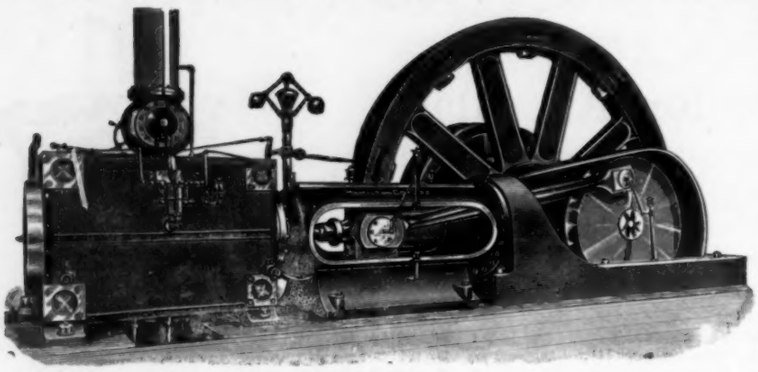

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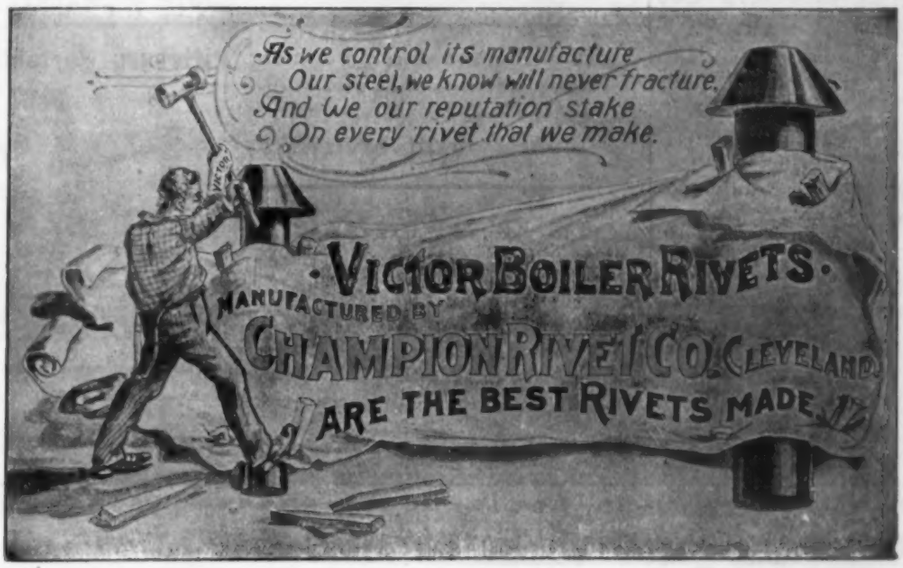
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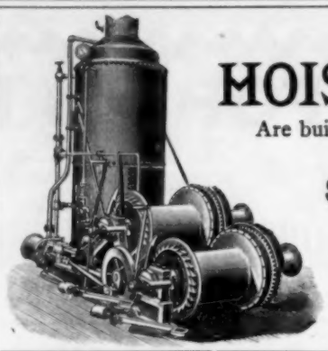

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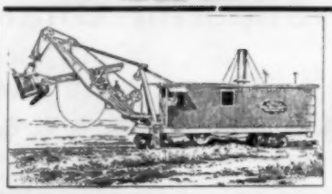

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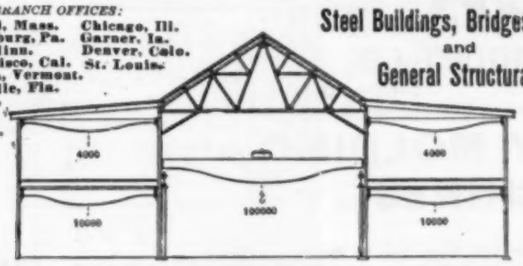

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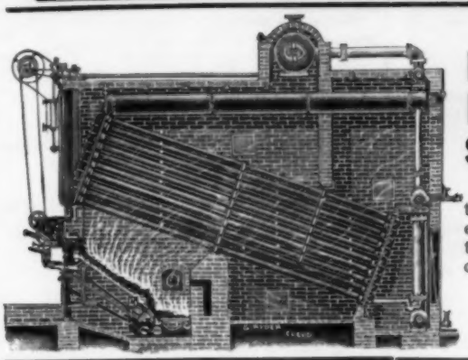

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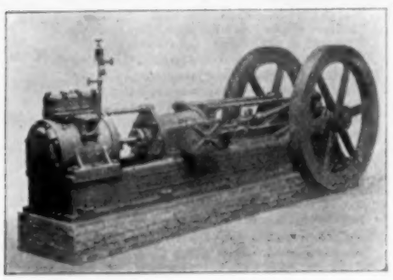

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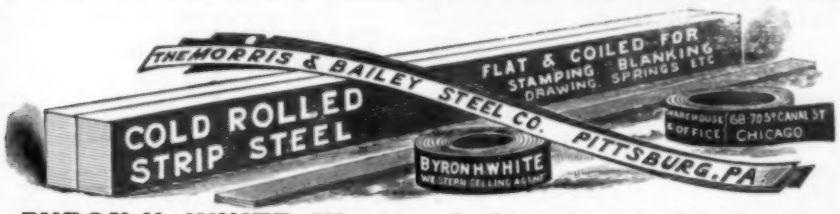
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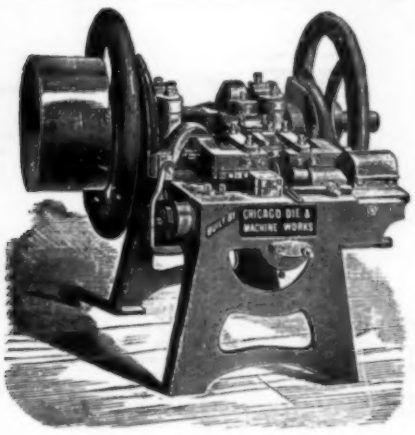

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Lake Superior Charcoal	..... 11 5
PITTSBURG:	
No. 1 Foundry	$10 50@10 65
No. 2 Foundry	10 00@10 25
Gray Forge	9 25@9 35
White and Mottled	... ... 9 00
Warm Blast Charcoal	13 00@13 50
Cold Blast Charcoal	22 00@26 00
Bessemer	10 35@10 50
CHICAGO:	
Lake Superior Charcoal	$11 50@$13 00
Local Coke Foundry No. 1	11 50@12 00
Local Coke Foundry No. 2	11 00@11 50
Local Coke Foundry No. 3	10 75@11 00
Local Scotch Foundry No. 1	11 50@12 00
Local Scotch Foundry No. 2	11 00@11 50
Local Scotch Foundry No. 3	10 75@11 00
Southern Coke No. 1	..... @10 85
Southern Coke No. 2	..... @10 60
Southern Coke No. 3	..... @10 10
Southern No. 1 Soft	..... @10 80
Southern No. 2 Soft	..... @10 65
Southern Silveries	11 25@11 50
Jackson Co. Silveries	12 50@14 50
Ohio Silveries No. 1	..... @ .....
Ohio Strong Softeners	12 00@12 50
Alabama Car Wheel	15 00@16 00
Malleable Bessemer	11 50@12 00
Coke Bessemer	11 50@12 00
CINCINNATI (reported by Rogers, Brown & Co.)	
Southern Coke No. 1, Foundry	$10 00@10 25
Southern Coke No. 2 and No. 1 Soft	9 75@10 00
Hanging Rock Coke, No 1	... . 9 45
Hanging Rock Charcoal No. 1, Fdy	14 50@15 50
Tennessee Charcoal No 1	12 50@13 00
Jackson County Silvery No 1	12 00@12 50
Southern Coke, Gray Forge	8 75@9 00
" " Mottled	8 75@9 00
Standard Georgia Car Wheel	..... 14 25@15 00
Tennessee " "	..... 13 00@14 00
Lake Superior " "	14 25@14 50
BUFFALO:	
No. 1 Foundry Strong Coke Iron Lake Superior Ore	11 00@11 25
No. 2 Foundry Strong Coke Iron Lake Superior Ore	10 50@10 75
Ohio Strong Softener No. 1	11 50@11 75
Jackson Co. Silvery No. 1	... . 14 00
Lake Superior Charcoal	... . 11 50
Southern Soft No. 1	10 50@11 7
Hanging Rock Charcoal	... . 1 0
ST. LOUIS:	
Southern Coke No 1	$ $10 50
Southern Coke No. 2	... . 10 25
Southern Coke No. 3	... . 9 75
Southern Gray Forge	... . 9 25
Southern Charcoal No. 1	... . 10 50
Missouri Bessemer	... . 13 00
Lake Superior Car Wheel	... . 13 00
Ohio Softeners	... . 14 00
Southern Car Wheel	... . 15 00

OLD RAILS AND SCRAP METAL.

[Delivered Cleveland.]	Gross Tons
Old iron rails	$14 00
Old steel rails (6 ft. and over)	9 75
Old steel rails (6 ft. and under)	9 75
Old car wheels	11 00
	Net Tons
No. 1 R. R. wrought scrap	$11 50
Mill scrap	8 50
No. 1 Machine cast scrap	8 25
Iron axles	15 50
Axle turnings	8 00
Wrought turnings (free from cast)	7 00
Cast borings	5 50
Uncut wrought iron boilers	5 00
Steel boiler plates	8 00
Grate bars	5 50
Pipes and flues (clean)	7 50
Tank iron	8 00
Hoop and band iron	7 50
Sheet iron	5 25
Wrought drillings	6 50
Malleable iron	8 50

STRUCTURAL MATERIAL.

Beams and Channels (f. o. b. Cleveland)	1.25c
Angles	1.15c
Tees	1.25c
Universal Plates	1.15@1.20c
Sheared Plates	1.20c

MERCHANT IRON AND STEEL.

[Less than car-lots, Cleveland.]

Rounds and Squares.—Bar Iron.

1 to 1⅞	1.05 Base
2 to 2⅞	.20 extra
3 to 3⅜	.50 "
3⅝ to 4	.80 "
4¼ to 4⅜	1.00 "
4⅝ to 5	1.30 "
5⅛ to 6	1.80 "
¾ to 6⅜	Bs

VITRIFIED EMERY AND CORUNDUM WHEELS. . .

FOR

Foundry and Machine Shop Work.

CAN BE RUN WET OR DRY.

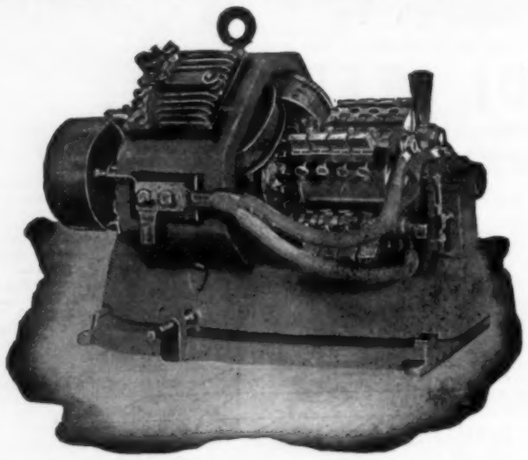
SOLD BY
Weed & Co., Buffalo, N. Y.
Strong, Carlisle & Hammond Co., Cleveland, O.
Machinist Supply Co., Chicago, Ill.
Gilgo Iron Store Co., St. Louis, Mo.

VITRIFIED EMERY WHEEL CO.,
Westfield, Mass.

Eddy Dynamo Electro-Plating Machines

FOR

BICYCLE PLATING PLANTS.



NORTHAMPTON EMERY WHEEL CO., 20 S. Canal St., Chicago, Ill.

EXCLUSIVE WESTERN SELLING AGENTS.

The Chicago & North-Western Railway

REACHING with its 7,900 miles of road the famous Water Powers, Coal Fields, Iron Ore Ranges, Hard and and Soft Lumber Districts located in Illinois, Wisconsin, Michigan, Iowa, Minnesota, South Dakota, North Dakota, Nebraska and Wyoming, and by traffic arrangements with other railways, 7,350 stations located on 41,000 miles of railroad (one-ninth of the entire railroad mileage of the world, and one-fourth of the railroad mileage of the United States), has on its line more industries than any other western railroad.

Manufacturers contemplating moving or establishing branch factories in the West are requested to inquire what we can offer them before locating elsewhere.

M. HUGHITT,
General Freight Agent,
CHICAGO.

A paper that is paid for and read—THE IRON TRADE REVIEW.

6⅝ to 7¼	2.50 extra
¾ to ⅞	.10 "
⅞ to 11-16	.20 "
¾ to 9-16	.30 "
7-16 to 15-32	.40 "
⅜ to 13-32	.50 "
5-16 to 1-32	.70 "
¼ to 9-32	.90 "
7-32	1.40 "
3-16	2.50 "

Flats.—Bar Iron.

1½ to 4 x ¾ to 1	1.05 Base
4¼ o 6 x ¾ to 1	.10 extra
6¼ o 8 x ¾ to 1	.60 "
8¼ o 10 x ¾ to 1	.80 "
1⅜ o 4 x 1 1-16 to 1½	.30 "
4¼ to 6 x 1 1-16 to 1½	.40 "
6¼ to 8 x 1 1-16 to 1½	.60 "
8¼ to 10 x 1 1-16 to 1½	.90 "
2 to 4 x 1⅜ to 2	.50 "
4¼ to 6 x 1⅜ to 2	.60 "
6¼ to 8 x 1⅜ to 2	.80 "
8¼ to 10 x 1⅜ to 2	1.00 "
2 to 4 x 2⅜ to 3	.60 "
4¼ to 6 x 2⅜ to 3	.80 "
6¼ to 8 x 2⅜ to 3	1.00 "
1⅜ to 1⅜ x ⅜ to 1	.10 "
1 to 1 1-16 x ⅜ to ⅞	.20 "
¾ to 15-16 x ⅜ to ⅞	.40 "
⅞ to 11-16 x ⅜ to ⅞	.50 "
½ to 9-16 x ⅜ to ½	.90 "

Heavy Band Iron.

7 to 10 x ¼ to 5-16	.70 extra.
6¼ to 6¾ x ¼ to 5-16	.50 "
4¼ to 6 x ¼ to 5-16	.30 "
1⅜ to 4 x ¼ to 5-16	.20 "
1 to 1⅜ x ¼ to 5-16	.30 "
¾ to 15-16 x ¼ to 5-16	.50 "
⅞ to 11-16 x ¼ to 5-16	.80 "
½ to 9-16 x ¼ to 5-16	1.00 "
⅜ to 7-16 x ¼ to 5-16	1.50 "

Heavy bands, 7-32 in. thick 1-10 c. per lb. higher than ¼ to 5-16 thick. **Bevel Edge Shaft Iron** 1-10 higher than same size of Heavy Bands.

Light Band Iron.

7 to 8 x No. 9 to 3-16	.90 extra
7 to 8 x Nos. 10, 11 and 12	1.00 "
6¼ to 6¾ x No. 9 to 3-16	.70 "
6¼ to 6¾ x Nos. 10, 11 and 12	.80 "
4¼ to 6 x No. 9 to 3-16	.50 "
4¼ to 6 x Nos. 10, 11 and 12	.60 "
1⅜ to 4 x No. 9 to 3-16	.40 "
1⅜ to 4 x Nos. 10, 11 and 12	.50 "
1 to 1 3-16 x No. 9 to 3-16	.50 "
1 to 1 3-16 x Nos. 10, 11 and 12	.60 "
13-16 to ⅞ x No. 9 to 3-16	.60 "
13-16 to ⅞ x Nos. 10, 11 and 12	.70 "
11-16 to ¾ x No. 9 to 3-16	.80 "
11-16 to ¾ x Nos. 10, 11 and 12	.90 "
9-16 to ⅝ x No. 9 to 3-16	1.00 "
9-16 to ⅝ x Nos. 10, 11 and 12	1.10 "
7-16 to ½ x No. 9 to 3-16	1.30 "
7-16 to ½ x Nos. 10, 11 and 12	1.40 "
⅜ x No. 9 to 3-16	1.50
⅜ x Nos. 10, 11 and 12	1.60

Bevel Edge Box Iron.

Same as Light Bands, of same sizes.

Beaded Band Iron, 1¼ in. to 2 in.....

Sand Band Iron, 1-10 c. above same sizes o Light Bands.

Oval Iron.

⅜ to 1½	.40 extra.
¾ to 13-16	.50 "
⅝ to 11-16	.60 "
½ to 9-16	.80 "
⅜ to 7-16	1.10 "
½ to 9-16 x 3-16	1.00 "
⅝ to 11-16 x ¼	1.20 "

Half Oval and Half Round.

2¼ to 3	.60 extra
⅞ to 2	.50 "
¾ to 13-16	.70 "
⅝ to 11-16	.90 "
½ to 9-16	1.20 "
⅜ to 7-16	2.50 "
5-16	3.50 "
¼	4.50 "

Half Ovals less than ¼ their width in thickness, extra price.

Horse Shoe Iron.

All sizes..... 1 c. extra.

Cutting ordinary bars to specified length, .20 to .30 extra, according to length and size.

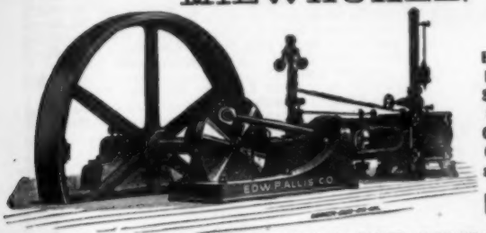
Steel Bands.

Width In Inches.	English Standard Gauge.		
1 1-2 to 6,	Nos. 7, 8, 9 or 3-16"	1.50	Base.
		Extras.	
1⅜ to 6,	" 10, 11, 12 or 1/4"	.05	per 100 lbs.
1 to 1⅜,	" 7, 8, 9 or 3-16"	.10	"
1 to 1⅜,	" 10, 11, 12 or 1/4"	.15	"
13-16 and ⅞,	" 7, 8, 9 or 3-16"	.20	"
13-16 and ⅞,	" 10, 11, 12 or 1/4"	.25	"
11-16 and ¾,	" 7, 8, 9 or 3-16"	.30	"
11-16 and ¾,	" 10, 11, 12 or 1/4"	.35	"
9-16 and ⅝,	" 7, 8, 9 or 3-16"	.40	"
9-16 and ⅝,	" 10, 11, 12 or 1/4"	.45	"
½,	Nos. 7, 8, 9 or 3-16"	.55	"
½,	" 10, 11, 12 or 1/4"	.60	"
7-16	" 7, 8, 9 or 3-16"	.75	"
7-19	" 10, 11, 12 or 1/4"	.85	"
⅜,	" 7, 8, 9 or 3-16"	.95	"
⅜,	" 10, 11, 12 or 1/4"	1.05	"

Iron and Steel Hoops.

Width Inches.	English Standard Gauge.		
7-16 to 3	Nos. 13, 14, 15 and 16	1.60	Base
		Extras.	
7-16 to 2,	" 17, 18, and 19	.05	per 100 lb
7-16 to 2,	" 20	.10	"
7-16 to 2,	" 21	.15	"
7-16 to 1¼,	" 22	.25	"
¼ to 1¼,	" 13, 14 and 15	.05	"
¼ to 1¼,	" 16, 17 and 18	.10	"

THE EDWARD P. ALLIS COMPANY
MILWAUKEE, WIS.



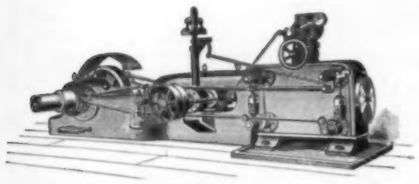
MANUFACTURERS OF

Blowing Engines, Hoisting Engines, Pumping Engines Air Compressors, Special Engines for Electric Lighting Street Railways and Rolling Mills. Ore Crushers, Crushing Rolls, Stamp Mills Concentrators, General Mining Milling and Smelting Machinery.

Reynolds Corliss Engines.

NEW YORK. CHICAGO. MINNEAPOLIS. DENVER. BUTTE. CITY OF MEXICO. SAN FRANCISCO. PITTSBURG.

THE LANE & BODLEY CO.,
CINCINNATI, OHIO.



Engines,

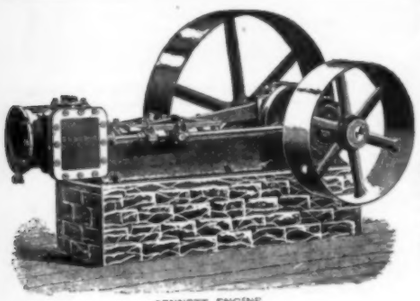
ALL SIZES.

Simple and Compound.

Shafting, Hangers, Pulleys.

Belt Elevators, Saw Mills.

THE GEO. B. SENNETT CO.
YOUNGSTOWN, OHIO.



SENNETT ENGINE.

MANUFACTURERS OF THE

Sennett Slide Valve Engine.

A well made and durable center crank engine of from 20 to 40 H. P. The design is thoroughly modern and all parts are made in duplicate. Engines kept in stock ready to run. Catalogues or prices willingly furnished. Among our other specialties is the

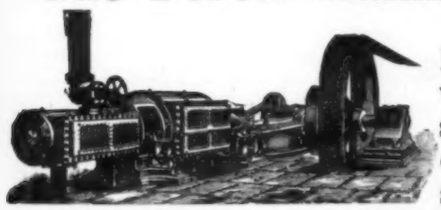
Sennett Compression Couplings.

(See advertisement next week.)

Foundry contracts solicited for Castings from 10 lbs. to 5 tons each.

WILLIAM TOD & CO.
YOUNGSTOWN, OHIO.

The Porter-Hamilton Engine



Reversing Engines, Blowing Engines, Converters, Hydraulic and special heavy machinery for the iron and steel trades.

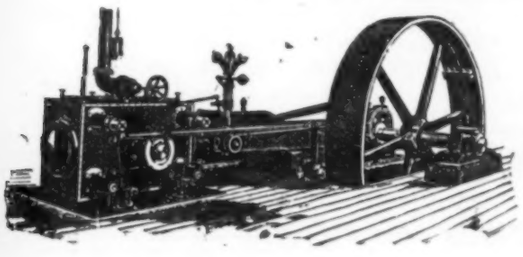
Williams Improved Vertical Engines

For Direct Electrical and all High Class Work.

39-41 Cortland St., N. Y. E. F. WILLIAMS

Park Building, Pittsburg. SEWARD S. BABBITT.

....The Rarig Engineering Company,
COLUMBUS, OHIO.



MANUFACTURERS OF

Heavy Duty Corliss

BLOWING - STATIONARY HAULAGE - HOISTING - Engines.

Boilers, Tanks, Steel Chimneys Structural Iron Work.

1⅝ to 1¾,	19 and 20	per 100 lbs.
1¾ to 1⅞,	21	.20 "
1⅞ to 1¾,	22	.30 "
15-16 and 1,	13, 14 and 15	.10 "
15-16 and 1,	16, 17 and 18	.15 "
15-16 and 1,	19 and 20	.20 "
15-16 and 1,	21	.25 "
15-16 and 1,	22	.35 "
⅞, Nos.	13, 14 and 15	.30 "
⅞, "	16, 17 and 18	.35 "
⅞, "	19 and 20	.50 "
⅞, "	21	.55 "
⅞, "	22	.65 "
¾ and 13-16 Nos.	13, 14 and 15	.30 "
¾ and 13-16 "	16, 17 and 18	.35 "
¾ and 13-16 "	19 and 20	.40 "
¾ and 13-16 "	21	.45 "
¾ and 13-16 "	22	.50 "
¾ and 13-16 "	23	.60 "
11-16, Nos.	13, 14 and 15	.35 "
11-16, "	16, 17 and 18	.40 "
11-16, "	19 and 20	.50 "
11-16, "	21	.60 "
11-16, "	22	.70 "
11-16, "	23	.80 "
⅝, Nos.	13, 14 and 15	.40 "
⅝, "	16, 17 and 18	.45 "
⅝, "	19 and 20	.55 "
⅝, "	21	.65 "
⅝, "	22	.75 "
⅝, "	23	.85 "
9-16, "	13, 14 and 15	.45 "
9-16, "	16, 17 and 18	.50 "
9-16, "	19 and 20	.60 "
9-16, "	21	.70 "
9-16, "	22	.80 "
9-16, "	23	.90 "
½, "	13, 14 and 15	.55 "
½, "	16, 17 and 18	.60 "
½, "	19 and 20	.70 "
½, "	21	.80 "
½, "	22	.90 "
½, "	23	1.00 "
7-16, "	13, 14 and 15	.80 "
7-16, "	16, 17 and 18	.90 "
7-16, "	19 and 20	1.00 "
⅜, "	13, 14 and 15	1.00 "
⅜, "	16, 17 and 18	1.10 "
⅜, "	19 and 20	1.20 "

Sheet Iron.

No. 10	1 50
No. 12	1 70
No. 14	1 60
No. 15-17	1 75
No. 18	1 85
No. 20	2 00
No. 22-24	2
No. 25-26	2 20
No. 27	2 30

English Tool Steel.

Jessop's	15½c
Hobson's "Best"	15½c
" "Choice"	35c

Steel Boiler Plates—1-4 in. and Heavier.

Tank	1 35
Shell	1 45
Flange	1 55
Marine Flange	1 60
Fire Box	2 05

Above includes plates 90 inches wide.

90 to 96 in. wide	¼c. lb. extra
96 to 100 in. wide	1c. "
100 to 104 in. wide	1¼c. "
104 to 106 in. wide	special.

Flats.	cts. lbs.
2 to 9-16 in. wide by 2 to ⅝ thick	.08

Bessemer and O. H. Steel.

Bessemer Machinery	base price,	1 40
Open-hearth Tire	"	1 45
Open-hearth Spring	"	1 80
Sleigh Shoe	"	1 45
Toe Calk	"	1 90
Cutter Shoes, tapered and bent	"	1 60

American Cast Tool Steel.

ROUND, SQUARE, AND OCTAGON.	cts. lbs.
1 to 2 in. inclusive	.08
9-16 to ⅞ in. "	.08
7-16 to ⅜ and 2⅜ to 3 in.	.09
3⅛ to 4 in	.09½
⅜ to 11-16 and 4⅛	.10
½ to 6 in	10½
¾ to 9-32 and 6⅝ to 7 in	.11
1 in	.13

Burden Boiler Rivets.

⅛, ¾, 11-16 and ⅞ inches diameter	3 00
Bridge ⅛, ¾, 11-16 and ⅞ inch diam	2 55

Wrought Pipe and Boiler Tubes.

Lap weld black, base, and 10 per cent				.78
Butt "	"	"	"	.72
Lap "	galv.	"	"	.70
Butt "	"	"	"	.67
Boiler tubes 2½" and smaller				72½
Boiler tubes 2½" and larger				.72
Casting screw and socket joint				dis. 50
Casing inserted joint				dis. 45

MACHINERY SUPPLY MARKET.

[From Store, Cleveland.]

Anti-Friction Metals.

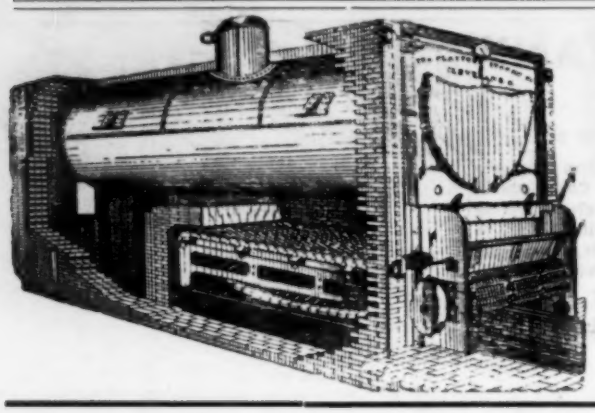
Magnolia Anti-Friction Metal, 25 cts. per lb., f. o. b New York or Chicago.
No Name Metal, 15 cts. per lb., f. o. b. New York or Chicago.
Mystic Metal. 10 cts. per lb., f. o. b. New York o Chicago.

Anvils.

American	₩ lb 9@11
Wright's	₩ lb 12

Bellows.

Blacksmiths'	Hill's	dis
	Bullock's	dis 50@10
Moulders'		dis 40@10
Hand		dis 40@10@50



The Playford Mechanical Stoker

Guaranteed to

Abolish smoke, to increase boiler capacity and to save fuel.

For information, address,

The Playford Stoker Co.,

404 Telephone Bldg.,

CLEVELAND, O.

IRON CLAD PAINT CO.

Factory, 75 & 77 Central Way. Sec. & Treas., No. 3 Case Build'g.

CLEVELAND, OHIO.

ORDER DIRECT FROM THE

Iron Clad Paint Co.

And get the genuine article, and save liability of suit for using an article made in violation of the patents issued to Wm. Green, and now owned by this Company.

IRON CLAD PAINT is the most durable, most fire-proof and Cheapest Paint made.

FURNISHED both Dry and Ground in Oil

USED BY NEARLY ALL THE RAILROADS.

Dixon's Pure Flake Graphite

Is a Blessing to Every Engine Room and Machine Shop.

A small quantity added to any Oil or Grease largely increases its lubricating value and makes the finest Cooling Mixture.

Pamphlet and Sample Sent Free.

JOS. DIXON CRUCIBLE CO., Jersey City, N. J.

FOR GREAT TENSILE STRENGTH, ELASTICITY AND ELONGATION, COUPLED WITH UNUSUAL NON-CORROSIVE QUALITIES,

Castings and Propeller Wheels

MADE FROM

PARSONS MANGANESE BRONZE

CANNOT BE EXCELLED. WRITE FOR PARTICULARS.

SOLE MAKERS,

THE WILLIAM CRAMP & SONS

Ship and Engine Building Company,

PHILADELPHIA, PA.

THE 1898 EDITION OF THE Iron and Steel Directory

Published by
The American Iron and Steel Association.

Will be sent postpaid by *The Iron Trade Review* at **$7.** Ready now.

Is a thorough revision of the list of blast furnaces, rolling mills, Bessemer and Open-Hearth steel works, plate and sheet mills, nail mills, tin plate mills, malleable, cast iron pipe and wrought pipe works, car wheel and locomotive works, with many new lists of works in other lines.

Belting.

Boston Belting Co.'s standard	dis 70 & 10
" " " extra	dis 60&10
" " " best	dis 35
Cleveland Rubber Co. extra standard	dis 60&10
Hoyt's Short Lap	dis 50
Shultz Raw Hide Leather Belting, single,	dis 40
Munson's Short Lap Single Leather	dis 50
Munson's Short Lap Double and Light Double Leather	dis 50&10
Shultz Raw Hide Leather Belting, Double and Light Double	dis 40
Standard, oak tanned	dis 50&10
Alexander Brothers' pure oak tanned	dis

Blowers and Exhausters.

B. F. Sturtevant's	dis 20
Boston Blower Co.,	dis 35

Chucks.

Cushman's 4 Jaw Independent	dis 45
" Combination	dis 40
" Geared Scroll	dis 80
" 2 Jaw Brass Workers	dis 30
" Drill	dis 35
Wescott's Scroll Combination	dis 33⅓
" Independent	dis 40
" Little Giant Drill	dis 33⅓
Horton's Independent	dis 45
Whiton's Independent	dis 45
National Combination	dis 45
Sweetland "	dis 40
Almond Drill	dis 40
Morse "	dis 20
Skinner's Combination Lathe	dis 40&15
" Independent Lathe	dis 40&10
" Universal Lathe	dis 40&10
" Drill	dis 30

Cutters and Reamers.

Cleveland	dis 10@15
Pratt & Whitney	dis 10@15
Standard	dis 10@15
Morse	dis 10 to 15
Brown & Sharpe, Milling Cutters	dis 15
" " Gear Cutters	dis 15

Crowbars.

Cast Steel	₩ 3¼
Iron, steel points	₩ lb 3

Drill and Drill Sockets.

Twist Drills	
Morse Taper & Straight Shank to 1¼"	dis 50 & 10 to 60
Morse Taper and Straight Shank Larger than 1¼"	dis 25
Drill Sockets	dis 25
Standard Twist Drills	dis 60@60&5
Cleveland " "	dis 60@60&5

Emery.

	No. 4 to No. 54 to Flour, C. F 46 gr.	150 gr.	F, F
Kegs, ₩ lb	4½c	5 c	2½c
½ kegs ₩ lb	4½c	5½c	2¾c
¼ kegs ₩ lb	5 c	5½c	3 c
10 ₩ cans, 10 in case	6 c	6½c	c
10 lb cans less than 10	10 c	10 c	½c

Emery Cloth and Paper.

Barder, Adamson & Co.	dis 50@50&5
H. H Barton	dis 50@50&5

Emery Wheels.

Detroit	dis 60@70
Norton	dis 60@70
Crant	dis 60@70
Sterling	dis 60@70
Celluloid	dis 10&33⅓
Northampton	dis 50
Crystal	dis 65@70
Vitrified	dis 60@70
Vulcanite	dis 60&10
Hamden	dis 60&10@70
Cyclone	dis 60@60&10

Files.

Arcade	dis 60&10@60&10&10
Nicholson	dis 60&10@60&10&10
" X. F	dis 25
Kearney & Foot	dis 60&10@60&10&10
Black Diamond	dis 60&10@60&10&10
McClellan	dis 60&10@60&10&10
Disston's	dis 65@70
Western	dis 70
Stub's	dis 2
Grobet's	dis 30
Reynolds Bros.' Hand Cut	dis 55
Industry File Works Hand Cut	dis 50

Hammers.

P. S. W	dis 40
Atha new list, Jan. 15, 1887	dis 50
Heavy hammers and sledges under 5 lbs	10c
" " " " over 5 lbs	8c

Jack Screws.

Illinois Bolt Co. list	dis 75

Nuts and Washers.

Size of bolt inches	¼	5-16	⅜	½	⅝	¾	1
Square	8	7	5½	4½	4	3½	3⅛
Hexagon	15½	11½	8¼	6	5¼	5½	
Washers	9	8	7	5	4½	4½	4⅛

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Zinc and Tin	dis 60
Brass and Copper	dis 50
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Picks.

Railroads, 5 to 6 lbs	dis $12 60
" 6 to 7 lbs	dis $13 60

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Rivets.

Iron, Thousand, list November 1, 1894	dis 60@60
Iron, Ordinary, Cooper's Block and Carriage list November 1, 1894	dis 60@65
Copper	dis 50@50&15

Taps.

Cards, Hand and Nut to 2 in.	dis 50
Carpenters' " " "	dis 50
Morse " " "	dis 50
Pratt & Whitney " "	new list....dis 10
Machine Screw Taps	dis 55
Pipe Taps to 2½ in.	dis 70
Stay Bolt Taps	dis 25
Stove Bolt Taps	dis 55
Pulley Taps	dis 40

Vises.

Solid Box	dis 60
Parker's	dis 20@25
Prentiss	dis 20
Stephen's	dis 25@30
Barrett's	dis 30
Miller's Falls	dis 40
Merrill's	dis 15@20
Howard	dis 35

Wire.

List, Apr. 9, 1894

Brass	dis 35c
Copper	dis 35c
Bright and annealed, Nos. 0@18	dis 70&10@75
" " Nos. 19@26	dis 75@75& 5
" " Nos. 27@36	dis 75&10& 5
Coppered Nos. 0 to 18, market list	dis 70@70& 5
Galvanized Nos. 0 to 18 " "	dis65& 5
Tinned market Nos. 0 to 18	dis 67½
Cast steel	dis 50
Tinned Broom Wire	dis 70&5@70&10
Annealed Fence, Nos. 8 and 9	dis 75
Annealed Grape, Nos. 10 to 14	dis 75
Stub's Steel Wire regular	95c ℔ ℔ dis 30

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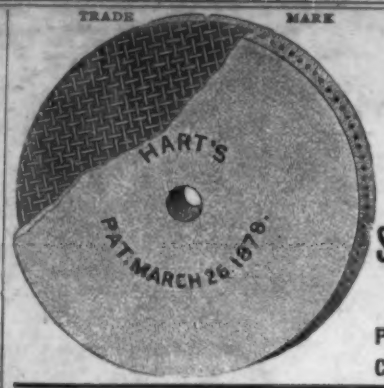

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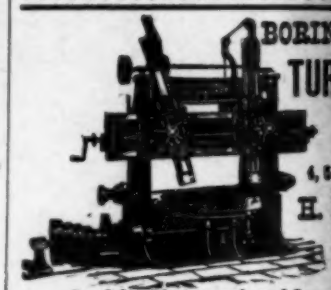

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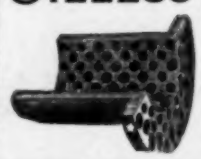

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